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Emergency Management Education In Canada

Canada

Acknowledgments

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Executive Summary

The purpose of this research report is to document and analyze the existing emergency/disaster management post-secondary courses and programs in Canada and proposes which directions, changes and/or reinforcements are needed to ensure Canada has a capability and capacity to generate a viable, professional and self-sustaining cadre of emergency management professionals and researchers.

For the purposes of this report, *post-secondary education* is defined as formal instruction leading to a degree or diploma received at a recognized university or college. Education is seen as distinct from training, which is typically more specialized, of shorter duration, and/or not contributing to a diploma or degree. Training courses and specialized certificate-granting institutes are outside the scope of this study. The authors recognize fully the importance of training in the emergency management context. However, this study is limited to post-secondary education.

In the context of this study, it is particularly important to understand the broad definition applied to *emergency management professionals*. The term is not limited to "emergency (disaster) managers" although they do represent a key component. Rather, it encompasses all those who have a need for broad or specific knowledge and understanding of emergency management principles and practices.

Through a comprehensive study of existing programs (remarkably few), targeted surveys to academics and industry, and a one-day strategic planning session with professionals and researchers working in the field of emergency management, this study demonstrated that Canada significantly lags countries such as Australia and the U.S. in establishing emergency management education programs, and consequently suffers from a lack of educated professionals and researchers working in this field.

What significance should be accorded to this situation? The obvious answer is Canada must immediately invest resources and considerable effort to narrow the gap. This may be the correct conclusion but for the wrong reason. Australia and the U.S. each have their own emergency management paradigms to meet their particular needs. While those needs may bear some resemblance to Canada's requirements, they are not completely congruent. Canada must establish a program that serves its needs, regardless of what other countries may be doing. We should not ignore what is being done in other countries nor should we blindly copy another country's example.

Unfortunately, emergency management education in Canada has not been identified as a requirement or priority. There is a critical shortage of qualified Canadian educators to develop and deliver courses, to supervise post-graduate students and to conduct research. Even with the best of intentions and the application of significant resources, this predicament cannot be quickly overcome. It will take considerable time to produce sufficient qualified Canadian educators to reduce our current reliance on international educators and produce Canadian emergency management literature that could inform the body of knowledge.

Leadership is urgently needed if Canada is to have an emergency management education program that will develop and sustain a credible and viable body of emergency management professionals. The status quo is not acceptable. It would fail to create the synergy needed to produce a Canadian community of emergency management professionals uniquely suited to address the Canadian paradigm. The longer the current situation is allowed to persist, the more difficult establishing a national program will become. The following recommendations could go a long way towards providing the educational support required by future hazard and emergency/disaster managers in Canada.

In the case of Australia, the U.K. and the U.S., leadership was provided by the federal government with input from other orders of government. In Canada there is no single entity with the mandate to take on the leadership role. The current situation has individual provinces going their own way, which is their right by law. However, typically this has the unfortunate effect of reducing cooperation, coordination and interoperability.

Ideally a national non-governmental body should lead this process in Canada, but no viable option currently exists. The best option today is to bring together the members of CCEMO (a national organization with standing and self-interest in a credible and viable emergency management community) with PSEPC to determine the way forward. Business and industry participation and opinion should also be solicited as part of this process.

Recommendation 1
• PSEPC should take the lead and initiate a federal/provincial/territorial working group with the goal of establishing national needs and educational guidelines for emergency managers.

In Canada, a forum does not currently exist for emergency management practitioners and academics to discuss and agree on research priorities, and to share information. Such a forum is critical for the development of courses and programs that recognizes the interdisciplinary approach and practical experience requirement for emergency management education that practitioners and academics deem as necessary.

This new program could leverage and build on individual activities such as the Stuart Nesbitt White Fellowship and PhD programs at the University of British Columbia and the University of Manitoba Natural Resources Institute. It should include a forum for the discussion of research priorities and for information sharing. The forum could be a virtual private network (VPN) that permits practitioners and academics to discuss, inform and debate emergency management issues.

Recommendation 2
• Through this working group, establish a program to support and educate the educators.

The absence of qualified Canadian researchers has resulted in a dearth of Canadian emergency management research. Through a council composed of representatives of the Natural Science and Engineering Research Council (NSERC), the Social Science and Humanities Research Council (SSHRC) and Canadian Institutes of Health Research (CIHR), a funding program targeted explicitly for Canadian research in risk, hazards and emergency management must be initiated. This would utilize a Canadian model for research funding that is well established and well accepted, and recognizes the interdisciplinary requirements of emergency management. The federal government could assume a leadership role in this initiative by providing funding for the creation of new research partnerships in EM, as was done for critical infrastructure protection in the NSERC-PSEPC Joint Infrastructure Interdependencies Research Program (www.nserc.ca/programs/jiirp_e.htm).

Recommendation 3
• Provide funding specifically for research related to emergency/disaster management priorities.

The federal government could promote research excellence and Canadian-based solutions by establishing a public and private sector partnership similar to that used for other fields in the National Research Council (NRC) model (www.NRC-CNRC.gc.ca). Such a partnership again utilizes a successful Canadian model that can be adapted to emergency management needs.

Recommendation 4
• Establish a public and private sector partnership to create research clusters for emergency/disaster management, based on the National Research Council model.

Strategic Planning Session participants supported certification of emergency management professionals as they believed it would assist the establishment of educational programs. However, the results of the survey of industry did not support certification, possibly because the majority of current emergency management professionals do not have a degree (nor believe it necessary) and do not, therefore, meet one of the typical requirements of certification programs. Previous attempts to establish a Canadian certification program were derailed by this issue. This will eventually resolve itself as new emergency management educated individuals enter the career field, and begin to leverage their knowledge and training to help build a forward-looking group of emergency management professionals in Canada.

Recommendation 5
• The issue of certification of emergency managers should be set aside for now, while fundamental educational programs and the foundation for emergency management as a profession in Canada are developed.

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1.0 Introduction

Within Public Safety and Emergency Preparedness Canada (PSEPC), the mission of Critical Infrastructure Protection and Emergency Preparedness (CIPEP)[1] is to enhance the safety and security of Canadians in their physical and cyber environments. In support of this mission, the Division of Research and Development (DRD) in CIPEP promotes research in the areas of critical infrastructure protection (CIP), emergency management (EM), and cybersecurity. The goal is to improve understanding of these issue areas and to develop solutions that will help manage, reduce, or mitigate Canada's exposure to risk and losses due to disasters, and enhance response capabilities to all hazards.

1.1 Context

Essential to national efforts to protect communities and critical infrastructure from hazards is the availability of courses and programs to educate and produce qualified emergency (disaster) management professionals. Recent years have seen increasing costs due to disasters, new and unprecedented threats to society in the form of terrorism and disease, and a corresponding introduction of legislation in many regions which mandates more comprehensive emergency management strategies. However, emergency management is not yet a formally established profession in Canada.

In the context of this study, it is particularly important to understand the broad definition applied to *emergency management professionals*. The term is not limited to "emergency (disaster) managers" although they do represent a key component. Rather, it encompasses all those who have a need for broad or specific knowledge and understanding of emergency management principles and practices.

1.2 Background

One of the key objectives of CIPEP is to "achieve an appropriate level of national civil emergency preparedness."[2] Toward that end, CIPEP commissioned a focused research report to document the availability of emergency (disaster) management related courses within Canadian post-secondary institutions, during the 2002-2003 academic year. The resulting report, *Inventory of Disaster Management Education in Major Canadian Universities* (Falkiner, 2003), audited six social science disciplines that included some aspect of hazard education in 38 of Canada's largest universities. Although not a comprehensive study of the field, the report findings suggested that "the current availability of disaster-related courses in Canadian universities is insufficient to meet the growing demand of disaster management professionals in Canada" (Falkiner, 2003).

In October 2003, CIPEP issued a request for proposals to document and analyze the existing emergency/disaster management post-secondary programs in Canada and propose what directions, changes and/or reinforcements are needed to ensure Canada has a capability and capacity to generate a viable, professional and self-sustaining cadre of emergency management professionals and researchers.

For the purposes of this study, *post-secondary education* is defined as formal instruction leading to a degree or diploma received at a recognized university or college. Education is seen as

distinct from training, which is typically more specialized, of shorter duration, and/or not contributing to a diploma or degree. Training courses and specialized certificate-granting institutes are outside the scope of this study. CIPEP and the report authors recognize fully the importance of training in the emergency management context. However, this study is limited to post-secondary education as defined above.

1.3 Objectives

The objectives of the research were:

- To determine the currently available courses and programs at Canadian colleges and universities relevant to emergency management professionals;
- To determine the current and future demand for emergency management professionals in Canada;
- To assess the requirement for educators and researchers to meet the Canadian demand;
- To assess the Canadian context in relation to the wider international situation;
- To document resulting conclusions; and
- To make recommendations for directions, changes and/or reinforcements based on the conclusions.

2.0 Methodology

To achieve the stated goals of this study, a number of activities – some concurrent and some consecutive – were undertaken. This section provides a description of those activities.

2.1 Post-Secondary Education Review

The purpose of the review was to determine the current availability in Canada of programs, specializations/majors/minors, and individual courses at the diploma, undergraduate, Master's and PhD levels that are relevant to emergency management professionals. The review was supplemented with the expressed views of emergency management practitioners and academics at a one-day strategic planning session. Additional information was gathered through interviews with selected practitioners and academics.

2.1.1 University Program/Course Review

All Canadian university websites and/or current academic calendars were examined during this study. The initial approach was to perform a keyword search of on-line university websites, using words such as emergency, disaster, risk and catastrophe. This approach proved ineffective because the majority of universities use search engines that scan their entire database, rather than just their course content database. For example, the University of British Columbia's (UBC) search engine located 1,470 hits for the phrase "emergency planning"; 1,610 hits for the word "disaster"; 12,300 hits for "risk"; and 286 hits for "catastrophe". A random review of the hits failed to identify any related courses or programs.

Keyword searching was abandoned and replaced by a structured three-tier search of 93 Canadian universities. The search included universities that offer programs in English, in French, and in both official languages. Certain assumptions were necessary in establishing this approach. The assumptions were grounded in the Canadian "bottom up" approach to emergency management. This approach begins with the individual that identifies an emergency situation and progresses upwards through local resources to the municipality, then to the province, and then to the federal government. The approach mirrors the size and complexity of the emergency and recognizes that various orders of government may have jurisdiction depending on the particular situation.

Tier One consisted of a faculty/department/program search at the diploma, undergraduate, and graduate levels to determine if the institution offered a field of study germane to this research project. This was an exhaustive search of the courses offered by each institution in the following fields of study:

- Public Administration
- Public Affairs and Policy Management
- Public Sector Management
- Local Government Management
- Community and Regional Planning

The assumption for Tier One was that these programs are likely to provide the courses that are most relevant to the Canadian approach to emergency management.

Tier Two performed an extensive audit of courses offered by each institution in the following fields of study:

- Geography
- Geology
- Environmental Studies
- Earth Science
- Community Economic Development

The assumptions for Tier Two were that geography, geology, environmental studies and earth sciences programs would offer courses relevant to natural disasters and community economic development would offer courses relevant to public safety and security. The overall assumption was that these programs had relevance to sustainable communities.

Tier Three performed a cursory audit of courses offered at select institutions in the following fields of study:

- Sociology
- Political Science
- Psychology
- Management
- Business Administration
- Engineering
- Law

The assumption for Tier Three is applicable to the broad definition applied to emergency management professionals; that it is not just "emergency managers" that may require education in emergency management principles and practices. The programs listed above provide a wide range of courses that may benefit the emergency management professional.

Validation of the findings came from the Government of Canada's on-line resource for information on Canadian educational opportunities.[3] A keyword search on "emergency" located 30 program matches in educational institutions across Canada; all 30 matches referenced First Aid, medical technician, paramedic programs, etc. When queried about university programs in Emergency Management Planning and/or Preparedness, the on-line counsellor for this site used four different specialized Web repertoires or search engines, along with some written information, and confirmed the lack of formal programs in this field.

As a final cross-check, information on websites belonging to the Canadian Centre for Emergency Preparedness, Disaster Recovery Institute Canada, Emergency Response Institute Canada, and Emergency Preparedness Information Exchange were searched. Individuals currently employed in an emergency management capacity often belong to one or more of these organizations. These sites frequently offer information to their members on the availability of training-related courses. However, from time-to-time they do offer information and/or links concerning educational opportunities.

In addition to the three-tiered search for emergency/disaster-related courses, the Dean of Graduate Studies (or equivalent) in a number of universities in every province were interviewed to ascertain if any graduate students' theses/dissertations concentrated on any subject relevant to this study to identify possible related doctorate programs. A further goal was to get an indication of the approximate numbers of recent PhD graduates in a related field. The universities contacted did not identify any theses/dissertations that concentrated on emergencies, disaster, risk management or other relevant subjects. See Appendix A for the list of universities contacted. Validation of the findings came from the Theses Canada Portal of Library and Archives Canada. A search was conducted of the on-line catalogue and electronic abstracts of theses using the search words listed in Appendix B for all Canadian theses and dissertations up to 2002.

2.1.2 College Program/Course Review

A representative group of Canadian college diploma-granting institutions was selected for inclusion in this study. For the most part, they were located in major cities in each of the 10 provinces. Colleges in Nunavut, the Northwest Territories and the Yukon were also included. The on-line course calendars of 74 colleges were searched in detail to identify emergency management programs. The complete program listings of the 74 colleges were reviewed to determine their applicability to this study. Programs such as Public Administration, Environmental Technology, Emergency Communications and Response, Geography, and Local Government Administration Professional were identified, and their corresponding course listings were reviewed in detail, again using the assumptions developed for the university-level course review.

The on-line course calendars for the colleges reviewed were maintained in much smaller databases than similar calendars for universities. The smaller databases greatly reduced the number of false matches. Therefore, it was possible to perform an additional search through the college websites, using the keywords: emergency, risk, disaster, hazard, and catastrophe. Every college that provided a search option on their website was checked for these keywords. This secondary check was in addition to the aforementioned program check. It is the nature of the majority of these institutions to offer academic or technical training of short duration, leading directly to specific occupations. Emergency education in the colleges typically consisted of relatively short-term (one to two years) studies to prepare students for a career in fields such as Emergency Medical Technician, Emergency Medical Responder, Emergency Communications and Response, First Responder, Paramedic, and so on. Rigorous validation on college-level findings was determined to be unnecessary. Nevertheless, validation was conducted by secondary word search using the terms listed in Appendix B.

2.1.3 Strategic Planning Session

A one-day strategic planning session was held in Ottawa, Ontario on Thursday, 5 February 2004. Ten participants and five observers – either emergency management educators or practitioners – from across Canada were invited to gather and discuss the state of emergency management education in Canada (see Appendix D for the list of participants).

The goal of the strategic planning session was to directly engage emergency management educators and practitioners in defining the current and future needs of post-secondary emergency management education in Canada. Although this was a significant challenge with limited time available, all the participants made excellent use of the opportunity to give direct input to an important national study.

Guided by a facilitator, participants explored five topics related to emergency management education and provided their opinions and experiences (see Appendix E for the agenda). The agenda was provided in advance to the participants so that they could prepare for the discussions. While every effort was made to keep the discussions on topic, there were inevitable overlaps. The discussions were non-attributable, thereby providing a platform for wide-ranging and, at times, intense commentary.

2.2 Current and Future Emergency Management Professional Demand

Ascertaining the current and future demand for emergency management professionals in Canada involved a survey of business and industry through a questionnaire, and an assessment of public sector requirements based on existing knowledge of that sector and selected interviews.

2.2.1 Business/Industry Questionnaire

To gain the perspective of various businesses and industries across Canada, a questionnaire was designed by SAIC Canada. The goal of the questionnaire was to solicit feedback and commentary on the current and future hiring trends in emergency management and related positions across Canada. In all, 500 questionnaires were distributed across a variety of business/industry sectors including, but not limited to, financial, manufacturing, petrochemical, pharmaceutical, transportation (road, rail, air and marine), mining, hospitality and not-for-profit organizations.

The preamble to the questionnaire recognized that emergency management functions may be performed by a variety of people, none with the title "Emergency Manager". The preamble also included definitions of formal education and emergency management (see Appendix F for the questionnaire). There were a total of 19 questions arranged in two parts.

The questionnaire contained no questions that would identify a specific company. The responses were considered business proprietary information and as such there was no attempt in this report to correlate individual responses to specific companies.

Part A of the questionnaire sought information that identified the respondent in general terms:

- position title;
- years in position;
- workload percentage devoted to emergency management;
- formal emergency management education; and
- responsibility for implementing emergency management functions.

Part B of the questionnaire sought information on the corporate emergency management profile. There were 14 questions in this part with one terminating question. Questions six through nine provide general information about the company (i.e. business sector, number of employees, etc). Question 10, the terminating question, requested information on whether a position had been established or whether there existed plans to establish a position for an emergency manager or someone requiring formal education in emergency management. The remaining questions sought specific information about the position and the education required.

The following hypothesis for distribution, response and analysis of the questionnaire was used:

- 95% confidence level;
- 10% confidence interval (margin of error);
- worst case percentage of 50%; and
- a response rate of 20%.

Based on our hypothesis, approximately 500 questionnaires were required to see 100 completed questionnaires returned (see Appendix G for details).

2.2.2 Public Sector Review

In assessing the current and future demand for emergency management professionals in the public sector, researchers reviewed federal, provincial and municipal legislation, interviewed selected practitioners in the various orders of government, and interviewed representatives of professional organizations.

2.3 International Trends and Developments

As a member of the world community, Canada is influenced by international trends and developments. A review was conducted of current trends and developments in emergency management education in the United States (U.S.), the United Kingdom (U.K.) and Australia. Research also considered the historical aspects of how post-secondary emergency management programs were initiated prior to September 11, 2001. This involved a review of pertinent websites and contact with informed individuals.

3.0 Findings

3.1 Program/Course Review

The program/course review provided few surprises for researchers. It confirmed the lack of programs and courses that are specifically identified as emergency (disaster) management.[4]

3.1.1 Canadian Universities

There are a limited number of Canadian universities offering undergraduate or graduate degrees in emergency/disaster studies. The Web search and the strategic planning session identified the available programs outlined below.

Undergraduate Degree Programs
Brandon University in Manitoba offers a B.Sc. in Applied Disaster and Emergency Studies (Disaster Science Concentration), and a B.A. in Applied Disaster and Emergency Studies (Planning & Management Concentration). A brief description of the Brandon University programs may be found in Appendix C.[5]

Lakeland College (School of Business) in Alberta,[6] offers a Bachelor of Applied Emergency Services Administration in their School of Business.[7] This program was introduced in January 2004.

At the University College of Cape Breton, there is a program with 42 credit hours that is designed for people with existing degrees or college diplomas. It provides further education in an emergency management-related field and is currently available through distance education only. The program is likely to evolve since demand is high enough that an on-campus program could be established. The program is built on partnership with expertise external to the university.

Dalhousie University has a risk management program funded by the Royal Bank of Canada. It is not a coherent degree in itself. Rather, it is a set of courses that all programs in the University can access as needed.

The Université de Sherbrooke offers a "Microprogramme de 2e cycle de gestion des risques: sécurité civile et environnement" and Université de Québec à Rimouski is developing a "Baccalauréat en sécurité publique" in their management department.

Furthermore, many universities offer a number of formal courses and ad hoc seminars that contribute to emergency/disaster management understanding in general. These programs are available either as part of a program leading to a credential, or on an open-registration basis. Since they do not lead to a degree in "Emergency Management" and, in some cases, do not lead to any degree, these courses were considered to be adjuncts to "training" as opposed to "education" for emergency management professionals. Examples include but are not limited to: Occupational Health and Safety, Security Management, Fire Safety, Business Recovery and Media Management. Such courses may form the basis of an interdisciplinary program much like the Brandon University model.

Graduate Degree Programs

In British Columbia, the School of Community and Regional Planning (SCARP) at the University of British Columbia offers a credit course at the graduate level in disaster management/planning. The new Chair of SCARP will be working to introduce an "area of concentration" in disaster management at the graduate level.[8] In addition, the University of British Columbia offers a Master of Arts and a Doctorate in Community Studies with a concentration in emergency management.

University of Waterloo in Ontario graduate students can take courses where they tailor their assignments to focus on emergency management or hazard-related topics. They can also write emergency management or hazard-related theses. This approach is beneficial to this field of study because the critical mass of students may not exist in one single program in the university.

The University of Manitoba has a PhD-level program in risk and hazard management. This program takes students from a suite of other programs and allows them to specialize within an existing program.

From the review of the Theses Canada Portal on the Library and Archives Canada site, it would appear that advance studies in this field can only be described as emerging. Of the thousands of papers on file at the Theses Canada Portal, only five relevant theses were identified during the search. Of the five, three were produced in the 1970s and addressed issues such as media management during emergencies. One of the most recent documents was *An examination of selected aspects of disaster recovery in urban environments by the Canadian Red Cross Society and the Barrie 1985 and Edmonton 1987 tornadoes* (Skapski, 1996). A limited number of relevant theses may have been missed due to the sheer magnitude of the database. However, the search results suggest the limited amount of disaster/emergency research that has been or is being conducted in Canada. Furthermore, Canadian universities are not graduating a significant number of people with advanced degrees in a related field, especially at the PhD level, which limits the pool of available professors for graduate programs.

3.1.2 Canadian Colleges

Only two colleges offered emergency management-related programs during the 2003-2004 academic year. La Cite Collégiale in Ontario offers a two-year diploma in Security Management. In this program, students are taught to create security awareness and prevention programs that focus on, among other topics, investigations, disaster planning and prevention, terrorist threats, and risk/danger analysis. Also in Ontario, Sir Sanford Fleming College offers a Bachelor of Applied Technology, Environmental Assessment and Management. This program is mainly based on environmental risk management and educates students to quantify environmental risk and to identify methods for eliminating and managing risk.

Furthermore, most colleges offer a number of formal courses and ad hoc seminars that contribute to emergency/disaster management training in general. These programs are available either as part of a program leading to a credential, or on an open-registration basis. Examples include but are not limited to: Occupational Health and Safety, Security Management, Fire Safety, Business Recovery, and Media Management.

3.2 Strategic Planning Session

The day-long facilitated strategic planning session produced some interesting insights into the different views of emergency (disaster) management of the participants. For the practitioners and educators, the session provided an opportunity (for some the first time) to inform the other participants of the topics for discussion. Common ground was found on many of the discussion topics.

The sections of the report that follow are directly related to the five discussion topics of the strategic planning session. The number of sections was expanded (eight report sections versus five discussion topics) to better address the ideas and opinions expressed by the participants. The sentiment and essential points of each participant's contribution have been maintained, although for clarity and brevity some editorial license has been applied.

3.2.1 Emergency Management as a Discipline

The first discussion centred on whether emergency management was a distinct discipline. The consensus was that it is not. The rationale was that, to effectively cover a wide-ranging subject such as emergency management, it was necessary to access information residing in *many* disciplines.

It was asserted by some that emergency management cannot be a discipline since the management approach to the issue is too narrow. There was a measure of acceptance that the two models of emergency management programs depicted in Figure 3-1 and Figure 3-2 represent contrasting conceptualizations of how emergency/disaster management fits with the disciplines allied with it. Figure 3-1 presents a program where there is significant core body of knowledge that may be considered unique to emergency (disaster) management. The centre of the figure represents the core with other disciplines providing specialist knowledge depending on the individual's needs. Figure 3-2 presents a program where the core body of knowledge specific to emergency management is quite small and where the supporting disciplines play a more significant role in supporting the individual's needs. Generally, emergency management could be placed under a variety of different programs, but the teaching of the topic itself must go beyond management.

Figure 3.1 Disaster Management as a Discrete Body of Knowledge Surrounded by the Disciplines that Inform It *(Source: Dr. Sarah Michaels, 5 Feb 2004)*

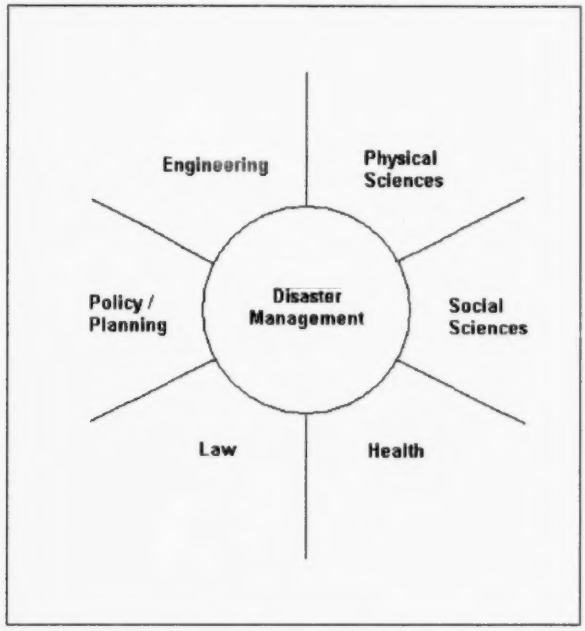
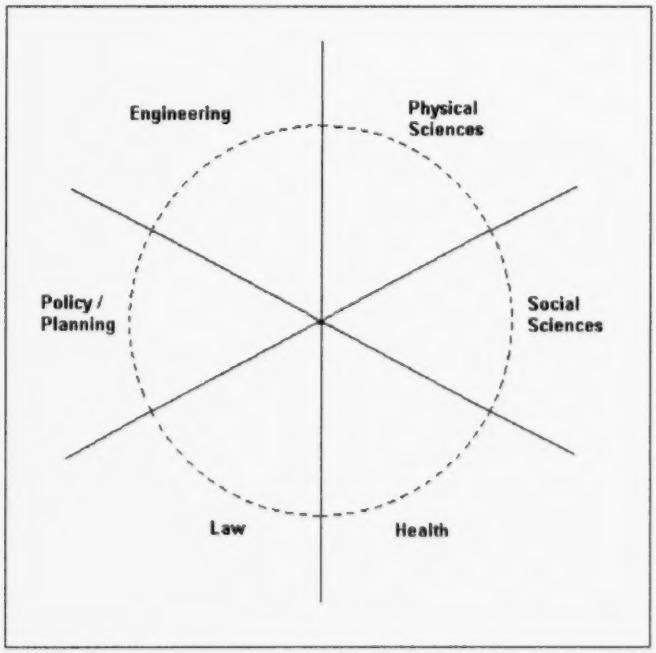


Figure 3.2 Disaster Management as the Sum of the Aspects of Disciplines Addressing Emergency Management *(Source: Dr. Sarah Michaels, 5 Feb 2004)*



Participants were split on the issue of a core body of knowledge for emergency management. The issue was not whether there was a core body of knowledge, but rather what constituted that body of knowledge. Some participants believed that the required number of elements is very small and that the rest must be context-specific for a given program. A problem for educators and practitioners is that a single emergency management job description does not cover the scope of emergency management program possibilities.

Generally, participants visualized formal emergency management education as a multidisciplinary program. In theory, it might incorporate many different issues, including social issues and environmental understanding, community development, public participation in policy development, concepts of management and administration, geography, and risk communication. Participants generally acknowledged that it was not worthwhile attempting to itemize the potential components and courses that might comprise an emergency management program. This had been attempted previously in the U.S. and left all participants dissatisfied. There would be a minimum number of required topic areas and the remainder will be application-specific (e.g., law for public administrators, or earthquake dynamics for structural engineers interested in emergency management). Another reason for avoiding attempts to rate the topics which should be covered under an emergency management-specific program is that university programs are constantly revised as new things happen. This is particularly true in the context of emergency management. Generally, it was agreed that the concepts of vulnerability, increased resilience, and reducing the probability and occurrence of high-impact events are key points.

There was also discussion that the concept of *risk and emergency studies* is broader and allows program developers in universities to engage other disciplines under this broader umbrella, particularly for postgraduate degree programs. There was some agreement that risk management provided a better context and educational platform for the many applications of emergency management. Risk and risk-based management are terms that can be applied within the emergency management context, and include key components such as vulnerability, adaptation and mitigation. Emergency management was seen by some as part of risk management, which itself was seen as part of public policy decision making. There was also a cautionary comment that care must be taken in using the term "risk management" as different disciplines, such as the financial industry, define it in different ways.

One participant supported the use of a single model, the International Association of Emergency Managers (IAEM) model, which establishes a common body of knowledge and provides the guidelines for what qualifications/knowledge emergency managers require. However, as previously discussed, emergency managers are only one subset of the people who might take courses, a full program or programs with a concentration in emergency management. There is no single solution. The two depictions presented in Figure 3-1 and Figure 3-2 suggests there is a common body of knowledge in emergency management, although in the case of Figure 3-2 it is quite small. To account for the variety of people who would enrol in these programs, the approach of inserting emergency management principles into existing programs was suggested as well.

The discussion of emergency management as a discipline highlighted the fact that emergency management cannot be pigeon-holed into one all-encompassing discipline. Emergency

management professionals represent a wide variety of functions and, therefore, require a correspondingly wide variety of courses and programs to meet their individual needs.

3.2.2 The Emergency Management Education Continuum

The idea that emergency management education takes place in a continuum was raised very early in the discussions. This point was acknowledged by all participants. The continuum consists of training through to formal education at the graduate degree level. The participants confirmed that training for specific jobs (such as emergency managers) can be incorporated into degrees and academic certificates. The student needs education and practical experience to piece together her appropriate program. A field supervisor is needed to ensure that the student gets the local expertise that reflects the research foundation. To build capacity, knowledge is needed in both areas. Currently, emergency management is not a discipline, but there is a need to take people already working in an emergency management capacity and provide the opportunity to get a formal education leading to a certificate or a degree.

The notion of an educational continuum was a recurring theme throughout the day's discussions, suggesting that this is an important concept for both practitioners and educators to grasp. An individual can enter, leave and re-enter the continuum at any point.

3.2.3 Who Requires Emergency Management Education

At the beginning of this report, it was stated that emergency management professionals were not only those who were designated "emergency (disaster) manager." Rather, a more inclusive definition was given that included all those requiring knowledge of emergency management principles and practices.

Among the participants, there was an acknowledgement that it is not just people who will become "emergency managers" who need formal emergency management education. Emergency managers are just one component. Many people working as emergency management professionals today have a military, police or firefighter background and have come into emergency management careers later in their lives. Historically emergency managers did not require degrees, but there is a perception shared by the participants that today the field almost demands it. Today's emergency management professionals, for better or worse, have had to rely on a mostly undocumented oral tradition as their body of knowledge or their previous experience in the military or paramilitary organizations (i.e. police, firefighter). Stronger support from academic programs would better connect today's emergency managers with the lessons and knowledge currently residing in the literature and the research community.

The point was made that the promotion of post-secondary education for people in the generally accepted larger context of emergency management should not be at the expense of those who are currently performing in an emergency management capacity.

There was agreement that to meet today's emergency management education demands, a much broader view of who requires this education is necessary.

3.2.4 Demand for Formally Educated Emergency Management Professionals

One consideration for many students when selecting college/university courses and programs is whether they will benefit from them when seeking employment after graduation. Are there any jobs for graduates of emergency management programs? If there are jobs, are they in the public or private sector?

There appears to be a market for graduates of emergency management programs. Eighty percent of the graduates from the former University of Sherbrooke program were employed in the private sector, not the public sector. From this it can be concluded that in Québec, there is a market in the private sector for people educated in this field. There has yet to be a graduating class of the Brandon University program, so employment data are not available. The university will soon see whether there are jobs for their graduates. However, indications from summer hiring of students has been encouraging and has included placements at the Vancouver Port Authority, Manitoba Emergency Management Organization, and the United Nations.

One participant observed that there are generally two markets. One is the demand for technical expertise, which can be delivered through training. The second is the demand for knowledge in areas of emergency studies – not necessarily emergency management. The academic market is not profit-driven since universities are public institutions, and while there needs to be a demand for the program that is in place, it is not about making profit. It must be understood that education is not about training so much as it is about critical innovation; it is about integrating concepts that come from academia into the operational setting where training comes to bear. This is not to say that academic programs cannot incorporate applied courses relevant to those working towards a career as emergency managers. There was general agreement that there needs to be a strong partnership between academia and applied emergency management.

Another market for formally educated emergency management professionals is academia. Unfortunately, Canada is critically short of people with graduate degrees (specifically PhDs) to help fuel research and create new knowledge in the disciplines related to emergency management. It is difficult to recruit experienced educators, particularly experienced Canadian educators, to teach programs in emergency management.

Based solely on the information available to the session participants, there does appear to be a job market for emergency management education graduates, particularly if a program includes practical experience (e.g. a co-op program). The experience of the participants indicates that opportunities exist in both the public and private sectors.

3.2.5 Developing Educational Infrastructure

Another issue raised by the participants was the need for the development of an emergency management educational infrastructure. As previously noted, individuals currently functioning as emergency management professionals in Canada have had to rely on their previous experience and a largely undocumented body of knowledge.

A recurrent theme in this discussion was the lack of a written tradition and of textbooks for teaching emergency management from a Canadian perspective. There is no real infrastructure or body of literature on emergency management in Canada that is easily accessible and reliable

from an academic perspective. Much of the available information is spurious or anecdotal. This information is frequently compiled from debriefings that are often conducted after an emergency for the purpose of developing a "lessons learned" package[9]. Unfortunately, usually the information is either not published in a report, or the report is confidential, thereby reducing its circulation. A Canadian emergency management clearinghouse for information sharing is needed.

The participants agreed that Canada needs a champion; someone with the academic credentials to garner the support of colleagues to grow and further develop emergency management programs. This is precisely what graduate students are looking for when searching for supervisors and programs to follow for their graduate work. Canada has no real champion; at the University of British Columbia it was a very slow process to find a Chair in disaster studies (Stephanie Chang). The core of emergency management higher education in Canada is tiny and the community must integrate all of the dimensions to develop required strengths in future emergency management professionals and professionals in related fields. This integration would be facilitated by the introduction of a champion for emergency management in Canada.

Start-up difficulties are common in new programs. There is also the problem of finding qualified educators, especially Canadian educators, to teach the courses. Despite this, students are increasingly trying to register in risk and emergency management fields and are searching for faculty to support their research and graduate studies. There are flexible models that could be used for emergency management. For example, at the University of Toronto, the risk analysis and management program uses a mix of guest speakers and faculty since there is no core group of expertise in any particular department. This is a very common approach. At Brandon University, it was necessary to compromise and to rely on international educators to fill the faculty positions. In Canada, there are less than 10 people who are both practitioners and academics. Because of this, for emergency management to progress, universities will have to rely on international educators and a mix of practitioners and academics to teach programs in emergency management. Courses and programs could be restructured around several people, including guest lecturers who certainly do not need to have a PhD. However, more PhDs are needed to promote and grow the field. The important point is to be able to use the resources where they exist; however, institutional resistance to the development of new programs is a significant obstacle. University politics can be a significant stumbling block to establishing courses and programs. This is particularly true for a subject such as emergency management that does not fit neatly into a particular discipline or field.

To promote collaboration between practitioners and educators, the University of Manitoba, through the Natural Resources Institute, is working to arrange a workshop for practitioners in risk and hazards management. The workshop is tentatively titled *Canadian Risks and Hazards*, and is to take place in November 2004. The organizers believed that a formal workshop based around disaster management or emergency management would not be supported as these fields are seen to be narrowly defined, and would not attract the broad spectrum of potential participants desired by the workshop organizers.

Mentoring was another education tool that was discussed. It was agreed that more attention needs to be devoted to the mentoring world. The ideal mentor is someone who knows both the

practice and the theory. The knowledge and expertise that does exist in Canada must also be recognized and a good coordination centre for it has to be established. More confidence in the Canadian expertise that exists and its application when required is needed. Research must put results into the hands of practitioners to ensure that knowledge is transferred and that the knowledge base in emergency management grows. Mentoring could accomplish both of these goals. Community outreach is a good way to help develop connections between academics and practitioners.

As evidenced in the preceding comments, establishing new programs is not without its challenges. The difficulties are exacerbated when there is also a lack of qualified Canadian educators and a dearth of readily accessible and reliable literature.

3.2.6 Requirement for Emergency Management Research

If emergency management is to be accorded the status of a discipline, it must mimic established disciplines. An essential component of all disciplines is a research capacity that supports and advances the understanding of the discipline. The participants offered their views on the nature of the requirement and how it might be met.

The distinct difference between community colleges and universities is that community colleges do not typically perform research. Universities develop the research capacity needed for any discipline. The disaster studies program at Brandon University was not placed in a community college precisely because colleges do not perform research, and in emergency management the research component must exist.

The role of research and development as a key component that supports the advancement and understanding of emergency management must not be lost. There was general agreement on the need for increased support of postsecondary education with R&D as a key component. The bar to support public policy development through research and development and emergency management higher education programs must be raised. Governments recognize emergency management is not just about "response." Public support of education systems for emergency management activities and for the decisions made at a public policy level is also needed.

Participants acknowledged the nearly non-existent research environment in emergency management and a very small disaster-related research community in Canada. It is critical to obtain more Master's and PhD research and to translate and transmit this information to practitioners. The connection between research and practice has been lost and it must be re-developed since research must drive practice. Unless Canada has a well-developed and integrated body of Master's and PhD grads to make the connections, getting the research to the practitioners will be difficult. Without these connections, practice is doomed to repeat the same mistakes.

There are other opportunities to establish connections between practitioners and research but many opportunities may have been missed. As mentioned previously, a national clearinghouse of information related to emergency management research would be helpful. Many current emergency management practitioners do not have an academic background and are not necessarily aware of the literature that is out there; it needs to be given to them. The literature

also often needs to be translated since much of it is too scholarly, and is not in a format that is easily understood by practitioners. A forum for research priorities and sharing of information is needed to permit practitioners to shape the focus of emergency management research and to allow educators to receive feedback on the usefulness of research. It was also mentioned during discussion that a national virtual private network (i.e. connecting all universities offering emergency management programs and/or conducting emergency management research with the federal and provincial authorities responsible for emergency management) for emergency management and disaster studies for information sharing would be supported by the New Brunswick Emergency Measures Organization.

Since in many small communities the emergency manager is often a volunteer, a quick response research model, such as the one used in the United States, might be a good way in which to make research more visible at the community level, and would ensure that lessons learned are transmitted quickly. Money for such a program could reside in one of the granting tri-councils (Natural Sciences and Engineering Research Council [NSERC], Social Sciences and Humanities Research Council [SSHRC], and Canadian Institutes of Health Research [CIHR]).

There are many areas of potential research in emergency management, and the application of science and technology in emergency management is one that has considerable potential. At the emergency responder level, the research could be focused on planning and response. At a higher level, the context would have to be broader and encompass all issues related to risk from all hazards. This topic should not be driven by structure (e.g. the four pillars [mitigation, preparedness, response and recovery] approach to emergency management); it needs to be looked at in a larger context. Much research related to emergency management is perhaps not labelled as such. For instance, the University of Toronto has a Risk Management Institute which is not yet formally linked to emergency management, but work conducted within this Institute could conceivably be applicable. A balanced approach to research is needed.

Best practices are not always so, even if they are commonly believed to be. The research often doesn't support certain practices, but this information has not been effectively transmitted to practitioners. Evidence-based recommendations would be better; but not enough standards and best practices are evidence-based. Research would provide that evidence.

Participants also believed it would be good to know, for instance, whether people who received a Stuart Nesbitt White Fellowship from PSEPC have actually graduated and gone on to research and teach in their field. The Fellowship was established in 1966 to encourage PhD research related to enhancing the safety and security Canadians. As of the 2003/2004 academic year, 48 persons had received funding through the Fellowship. Of note, three recipients, two participants, and one observer attended the strategic planning session.

One participant recently wrote a chapter in a book on quick response programs. The author pointed out that research and development needed to be part of emergency response plans. This would help people in the field frame their ideas and ensure that the research that is undertaken contributes to policy and the development and improvement of operations. Emergency managers need to realize that research is part of the management cycle.

If emergency management is to become a discipline, there must be a research capacity within the university community. That capacity must have ready access to practitioners and vice versa. The sharing of knowledge is critical to successfully advancing the theory and practice of emergency management.

3.2.7 Emergency Management Professional Certification

The assessment of professional certification was not a stated goal for this report, but it was implied by the use of the term "emergency management professional." The participants were asked to provide their views on the importance of certification and how it might be accomplished.

There was a suggestion that it would be advantageous if the certification and accreditation issues in Canada related to emergency management were resolved. The issues centre on the manner in which individuals currently employed as emergency management professionals would acquire professional status. Most certification/accreditation programs require a degree, which many current practitioners do not have. Resolving these issues would certainly help education programs move forward, especially coordination of programs and course offerings between universities.

The Canadian Emergency Preparedness Association (CEPA) was created in May 1998 under the sponsorship of Emergency Preparedness Canada, now known as Public Safety and Emergency Preparedness Canada. CEPA is a national forum whose main purpose is to promote emergency preparedness across Canada and represent the interests, aims and opinions of those who are involved in prevention/mitigation, planning, response and recovery. There are nine chapters across Canada, one of which is the national chapter. CEPA's principal areas of interest are information exchange, training, standards, professional accreditation and course accreditation by education and training institutions. CEPA established a working group to resolve the certification and accreditation issues in Canada, but an agreement on a common approach was never reached.

Today, many provinces have withdrawn their support for CEPA. This is unfortunate as many believe there is a need for a national body to help direct the development of postsecondary programs for emergency management, particularly as they relate to the education and training of future emergency managers. It was also agreed that Canada should not rely on the U.S. for standards. A forum for dialogue is needed, but CEPA no longer seems to be that forum.

Most professional associations for other disciplines have degree requirements, and the professional standards/testing comes after. Many certification programs started with the degree because without the degree it was difficult to get any institutional support. It is a cart before the horse issue for emergency management since there are already many people working in the field without a degree. One way to resolve this problem is to exempt (grandfather) the existing people with experience and training (including continuing education), and then gradually introduce the degree requirement to professionalize the field.

In Canada, the Brandon University program represents the "top-level" solution by generating emergency management professionals with a four-year degree. Graduates of the Brandon program will be well positioned to achieve professional accreditation since they have not only a

degree, but a degree specific to emergency management. Additionally, because of the nature of the Brandon program, graduates will have gained practical experience, typically another requirement of accreditation programs. However, there must be other models (e.g. UCCB) that address requirements for specializations in emergency management for people with previous degrees and/or who are upgrading their degree or involved in continuing education to gain/retain certification. It was suggested that connectivity, portability, and compatibility between various program models would be desirable.

For the participants, certification/accreditation was an important goal for emergency management practitioners, but there was no agreement on how this should be accomplished. The value resides in helping education programs move forward, particularly coordinating programs and course offerings between universities. It also raises the profile of emergency management and may make it easier to establish new programs.

3.2.8 Developing an Emergency Management Culture in Canada

Recent events in Canada (e.g. power outage in Ontario, forest fires in B.C.) and in the U.S. (e.g. 9/11) suggest that Canada is not immune to the ravages of nature, to technological failure, or acts of terrorism. To effectively deal with the consequences of the variety of potential emergencies, it may be beneficial to establish an emergency management culture that reflects Canadian aspirations for safety and security.

It is very early in defining the field of emergency management. It may reach the point of becoming a developed discipline, but it may not be called emergency management once it arrives. A name for the work that is performed does not really exist; it is still an emerging field. To teach in the real world requires partnerships as the foundation for moving forward. Outreach is a key component. More work needs to be done with respect to promoting visiting scholars, involving students in coordinating activities related to emergency management studies, and ensuring that there is sufficient student supervision available for graduate work. A mix of government and university researchers can be used to mutual advantage.

There are currently two needs in the emergency management field: a knowledge and research need, and a professional need. The professional need lies in certification and accreditation and is a non-academic process. The knowledge and research need comes out of Master's and Doctorate level programming. To sell an emergency management program within a local area is easy, but can emergency management itself be a discipline or an area of knowledge? It doesn't appear so. It is difficult to capture the field that is being discussed in a single word. Risk, public safety, and emergency management are all parts of it. The name of this field will continue to evolve. Critical infrastructure protection (CIP) is an important area, and the tools available for the understanding of this are limited. There is no discipline to govern or manage CIP, but it might be part of this developing discipline that for now is called emergency management.

One participant suggested that governments should provide leadership and supply doctrine for emergency managers, especially on standards. Also, there should be academic representation at the operational level to help ensure the research/practitioner connection is made. Other participants suggested that regulation must be used judiciously to ensure its best use rather than imposing government regulation. The goal is to build safer communities for Canadians. For

example, in B.C., municipalities must have an emergency plan, but it has been found that regulation alone does not fill the gap. Emergency planning cannot simply be legislated – *what* is legislated is the key. What it means also has to be illustrated and demonstrated. Priorities in this area need to be mapped with a political focus; a capacity must be built and practitioners ready to use it.

A proper public policy process for emergency management would be helpful. A reward system is needed as well. It would be interesting to explore regulations that create reward programs promoting emergency management (such as those used in oceanic oil spills). Incentives work better than a punitive approach in risk management; there is considerable literature to illustrate this point. The research capacity needs to be developed and it must be recognized that partnerships have to be formally developed to ensure research can help practitioners. Perhaps an equivalent to the National Emergency Management Association (NEMA) could meet this need. This would provide a forum where academics and practitioners could dialogue and harmonize arguments to work towards a collaborative solution, fostering academic engagement.

3.3 Current and Future Emergency Management Professional Demand

3.3.1 Business/Industry Demand

Of the 500 questionnaires distributed, 103 completed questionnaires were returned. This met the goal of a 20% return rate. Part of the survey was only for those with existing EM positions (these numbered 42). Since not all respondents answered all questions, the sample size (n) for each question is indicated in the accompanying figure caption.

The questionnaire was addressed to the Vice President Operations with the caveat that emergency management functions may be the responsibility of a variety of individuals. In some companies, it may be the security professionals who are responsible; in others it may be the business continuity professional or perhaps the occupational health and safety professional. The questionnaire requested that the person in the company with the most familiarity with the company's emergency management functions should complete the questionnaire.

Figure 3-3 illustrates where the respondent is located within the company organization. Of the 103 returned questionnaires, 101 respondents provided information as to their position within the company. The position occupied by respondents covered a wide spectrum from president to health and safety officer. None of the respondents identified themselves specifically as an "Emergency Manager." The largest segment of respondents (26%) referred to their position as "health safety and environment." The next closest category was "operations" with 23%. For this analysis, these positions were appropriately grouped into nine categories.

Figure 3-3 Respondents' Position in Company Organization (n=101)

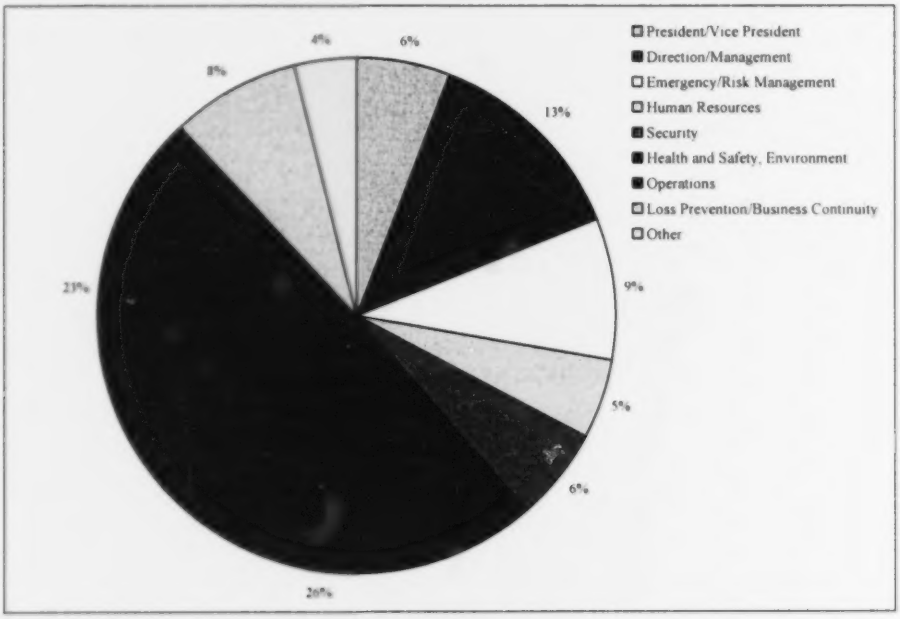


Figure 3-4 Time Devoted to Emergency Management functions by Respondent (n=100)

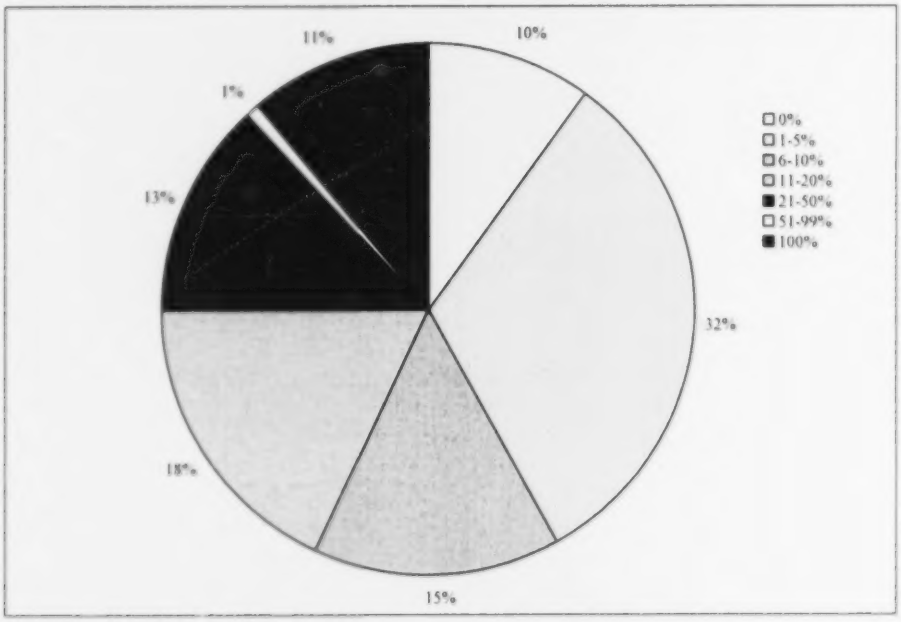


Figure 3-5 illustrates the formal emergency management education of the responder. Of the 103 responses to the level of emergency management education of the respondent, 56% answered "none". The next highest response was 32% for "other", which most respondents identified as training courses. This is not surprising given the lack of available formal emergency management education in Canada.

Figure 3-5 Emergency Management Education of Respondent (n=103)

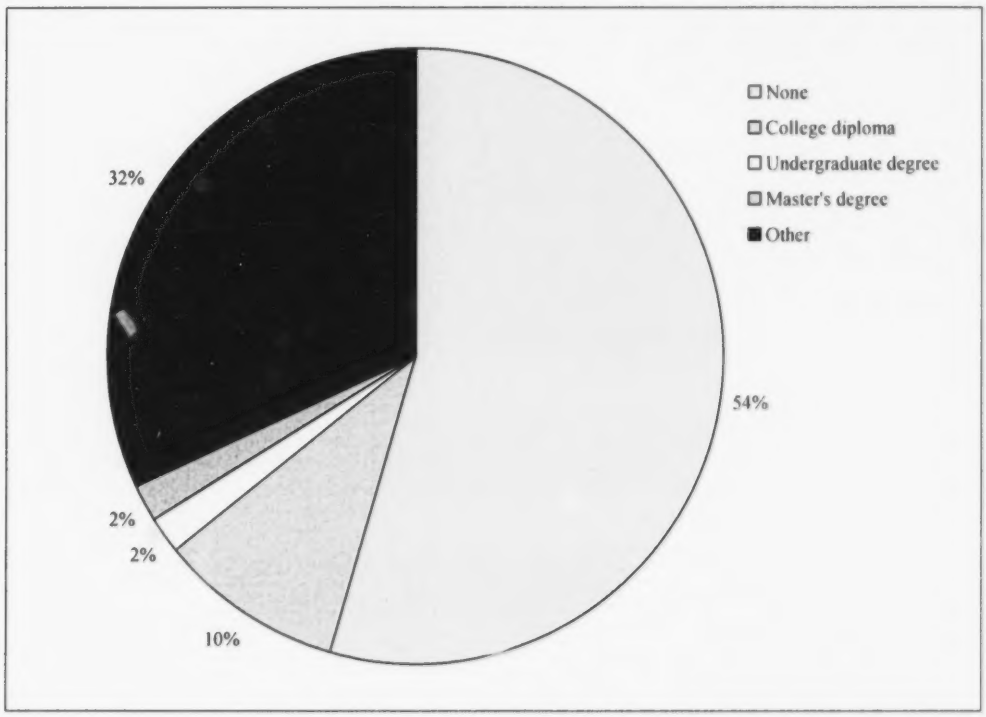


Figure 3-6 illustrates the business/industry sector of respondents. The 101 responses represent 12 business/industry sectors. The largest group (22 responses) represent the manufacturing sector. In the questionnaires, there were many different responses given for this section. To simplify analysis, the responses were categorized in appropriate categories.

Figure 3-6 Business/Industry Sector of Respondents (n=101)

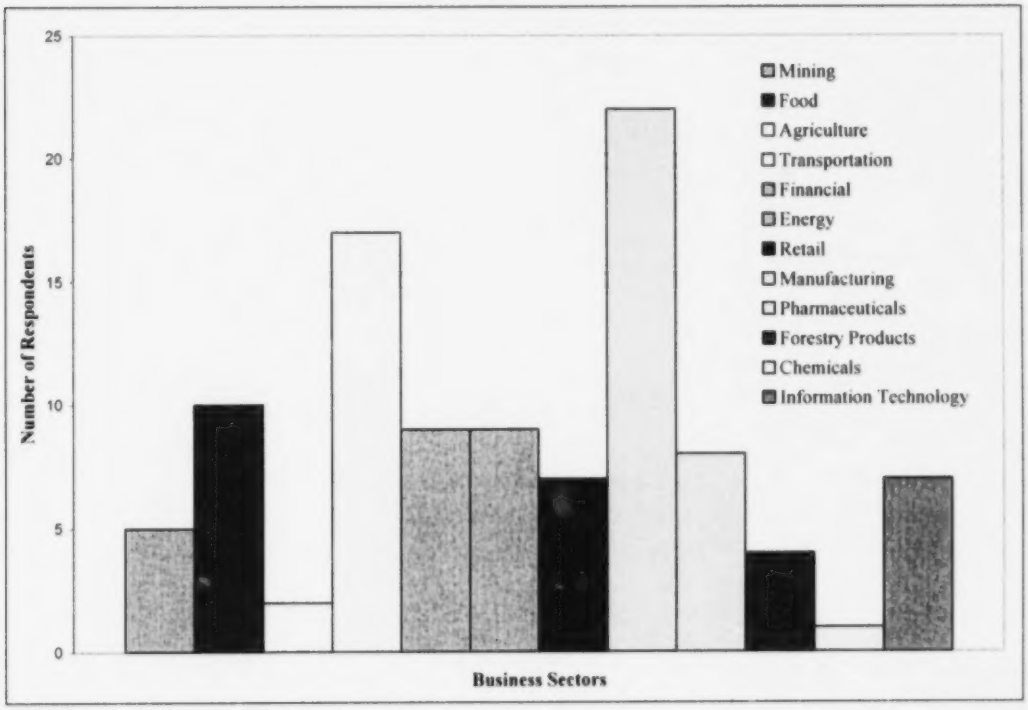


Figure 3-7 presents the provinces and/or territories in which respondent companies operate. All 103 respondents answered the question in which province(s) and/or territory(ies) their company operates. Forty-five companies operate in a single province only. Fourteen respondents indicated their company operates in all provinces and territories, while another 10 operate in all provinces. The remaining 34 companies operate in multiple provinces and/or territories but not all. For this reason, the number of responses will not add up to the sample size, n.

Figure 3-7 Provinces/Territories of Operation (n=103)

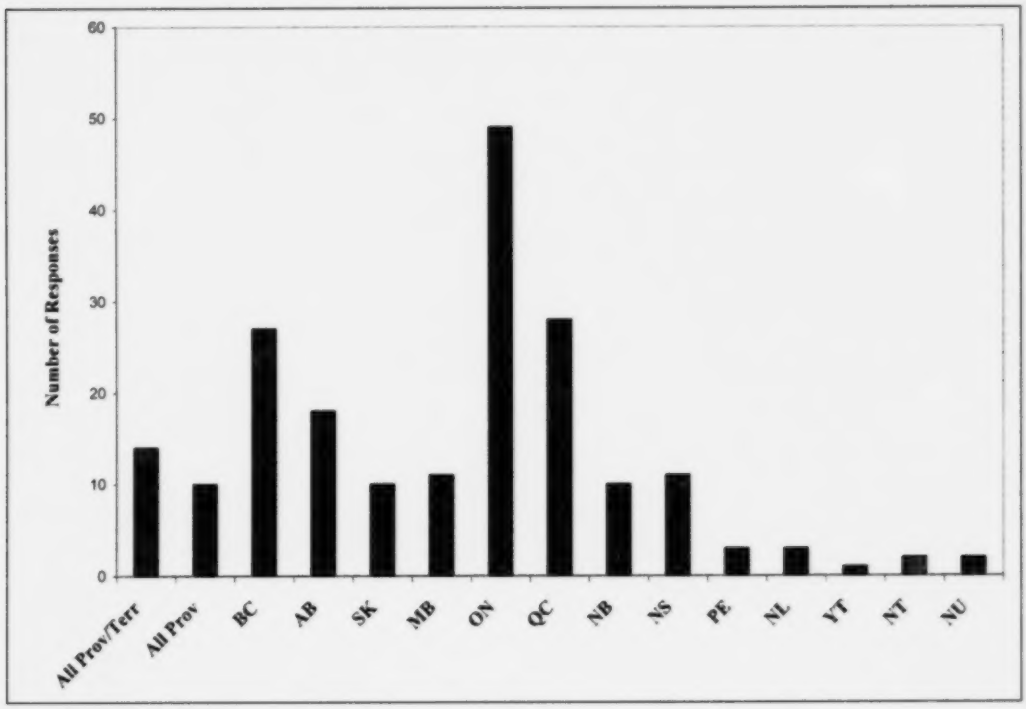


Figure 3-8 illustrates the size of respondent companies. Although they represent approximately 0.02% of the total number of companies in Canada, those with more than 500 employees provided 60 of the 103 responses to the question of company size. As will be seen in Figure 3-10, this group also had the highest number of established positions for emergency managers.

Figure 3-8 Company Size (n=103)

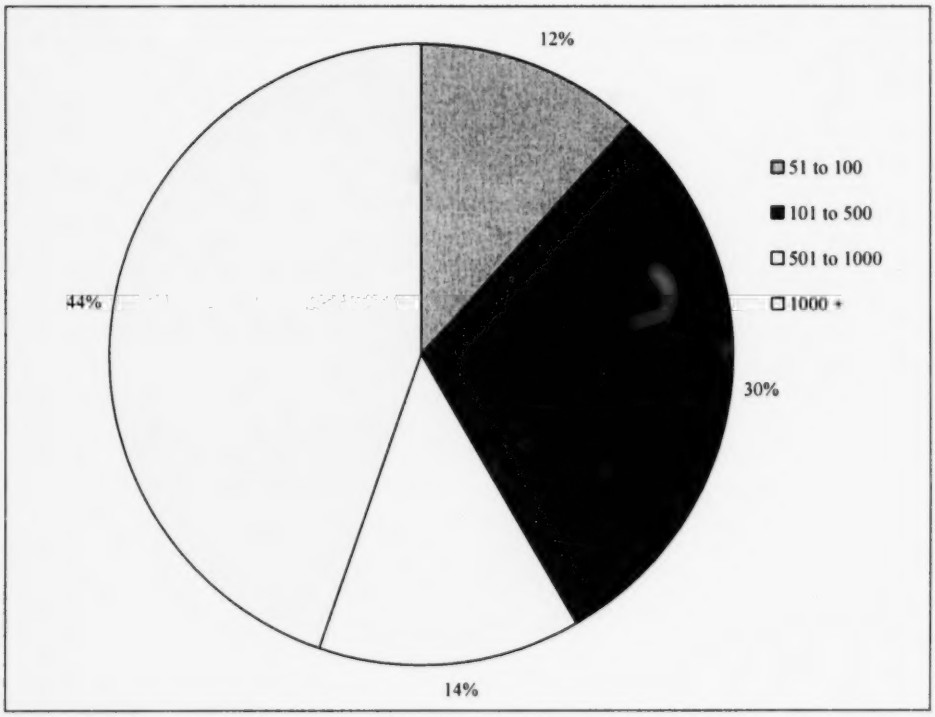


Figure 3-9 illustrates the response to whether a company had established or was planning to establish a position for an emergency manager. This figure is associated with question 10 in the survey (the terminating question). If the respondent answered no to the question of whether their company had established or was going to establish an emergency manager position, the questionnaire ended there. Fifty-nine percent of respondents answered no.

Figure 3-9 Established Emergency Management Positions (n=102)

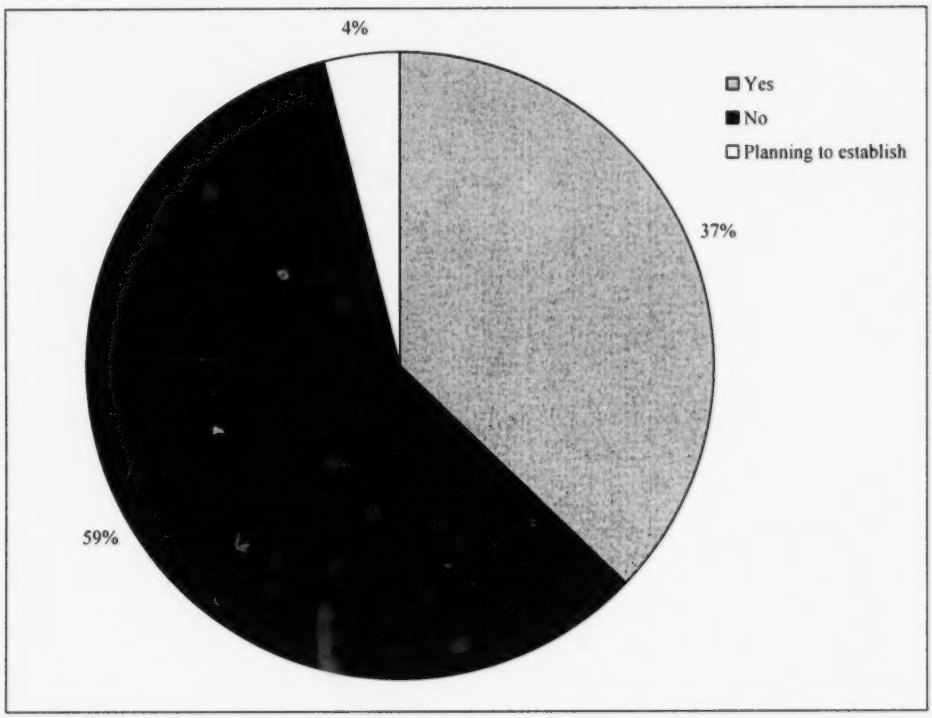


Figure 3-10 illustrates emergency management positions based on company size. The researchers surmised that there may be a correlation between company size and the establishment of a position for an emergency manager. In business, the inviolability of the "bottom line" is a constant. Emergency management positions are non-revenue generating positions. Such positions are normally kept to a minimum. Larger companies may be able to afford an additional non-revenue generating position for an emergency management professional where a smaller company probably could not.

Figure 3-10 Emergency Management Positions Based on Company Size (n=102)

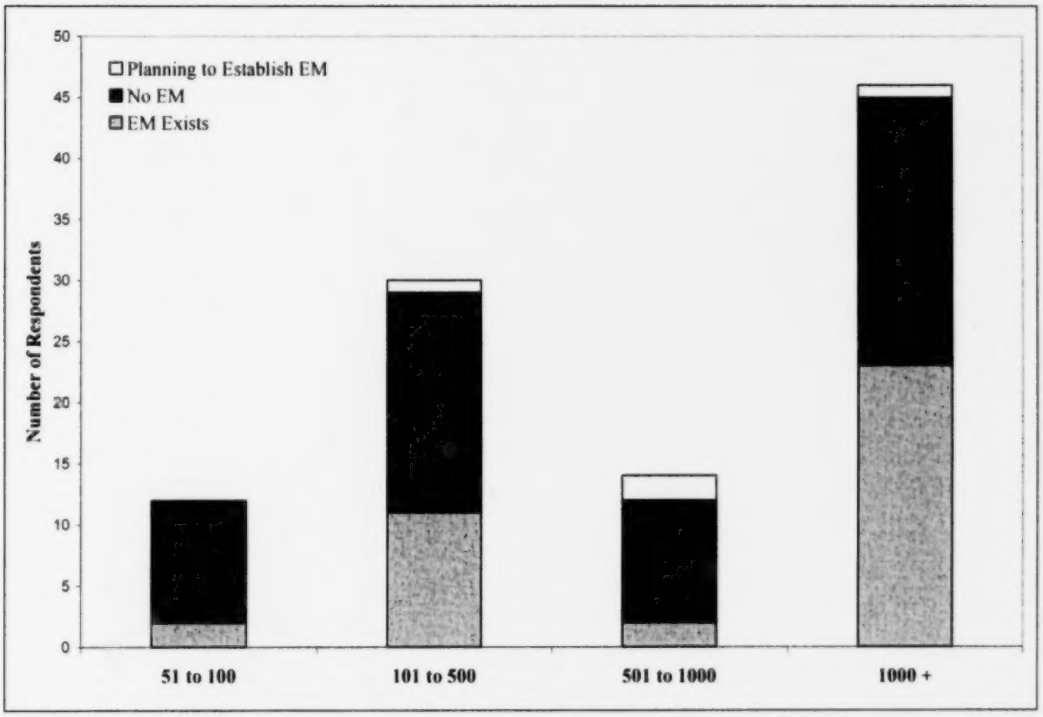


Figure 3-11 represents emergency management positions based on business/industry sector. There were 100 responses to this question. When viewed by business/industry sector, the transportation sector indicated the highest number (13) of established emergency manager positions. The largest number of respondents in this sector were airport authorities.

Figure 3-11 Emergency Management Positions Based on Business/Industry Sector (n=100)

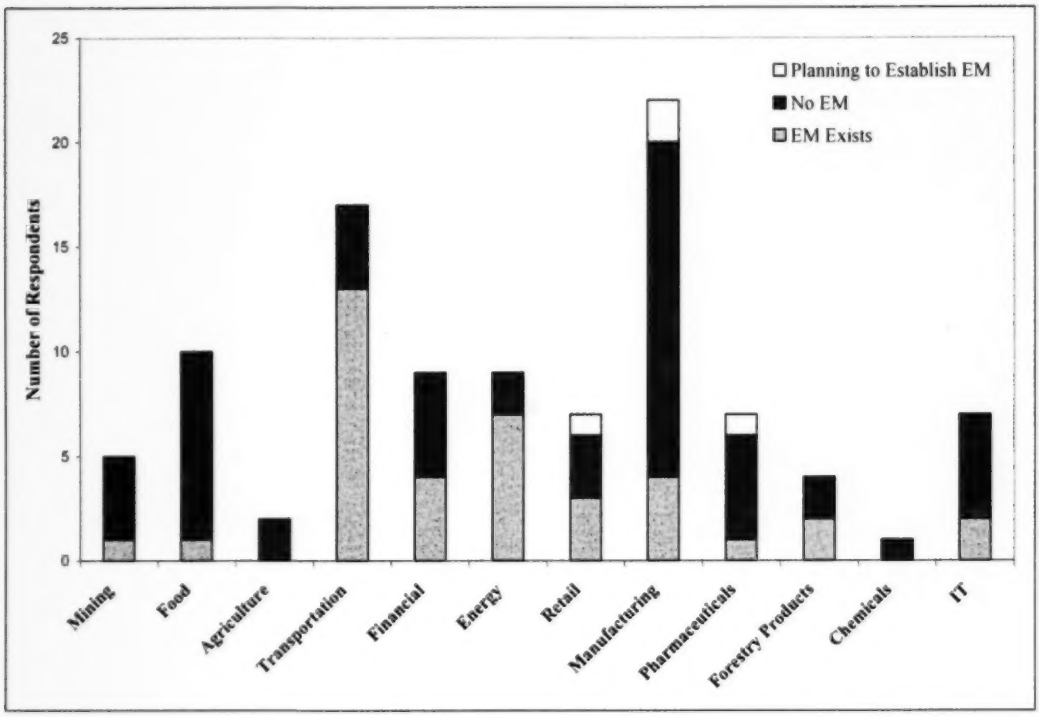


Figure 3-12 illustrates the length of time emergency management positions have been established in respondent companies. Forty-two respondents provided information on how long the emergency manager position had been established. Forty-three percent of the positions were established within the preceding two years, while a further 29% had been established more than two years ago. It should be noted that the questionnaire did not offer the option of "more than 2 years ago." Many respondents volunteered this information and it was therefore recorded. It is possible, however, that some respondents who answered "last 2 years" established the emergency management position more than two years ago. This applies to Figure 3-13 as well.

Figure 3-12 Length of Time Emergency Management Positions Established (n=42)

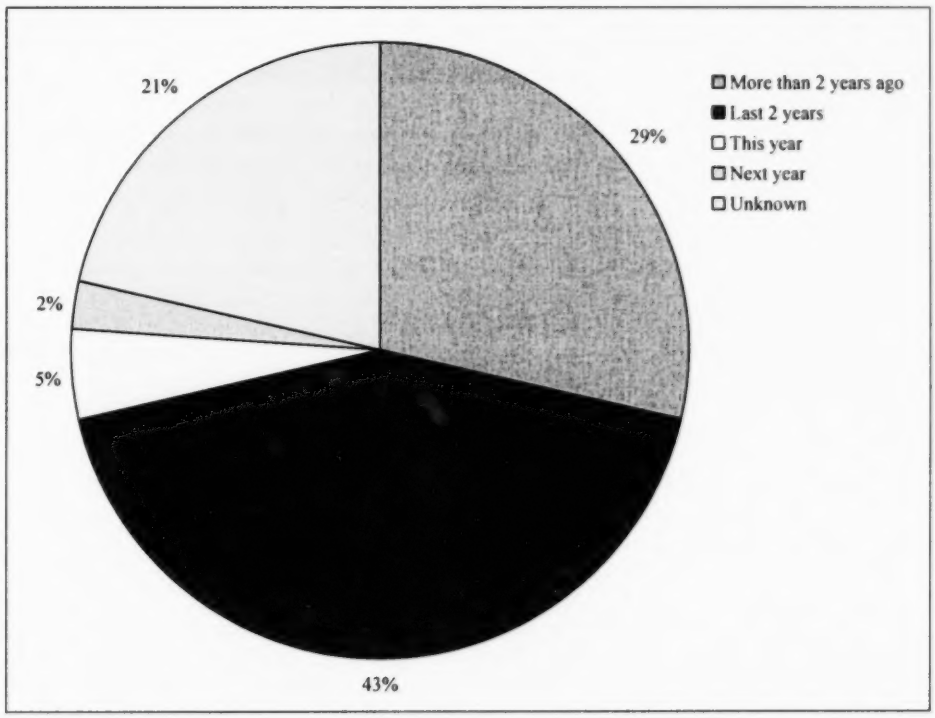


Figure 3-13 illustrates the length of time emergency management positions have been established within the responding business sectors. The transportation sector is heavily influenced by the number of airport authorities that responded to the questionnaire. Of the 42 respondents, 18 indicated the position was established in the preceding two years, while 12 indicated the position had been created more than two years ago.

Figure 3-13 Length of Time Emergency Management Positions Established by Sector (n=42)

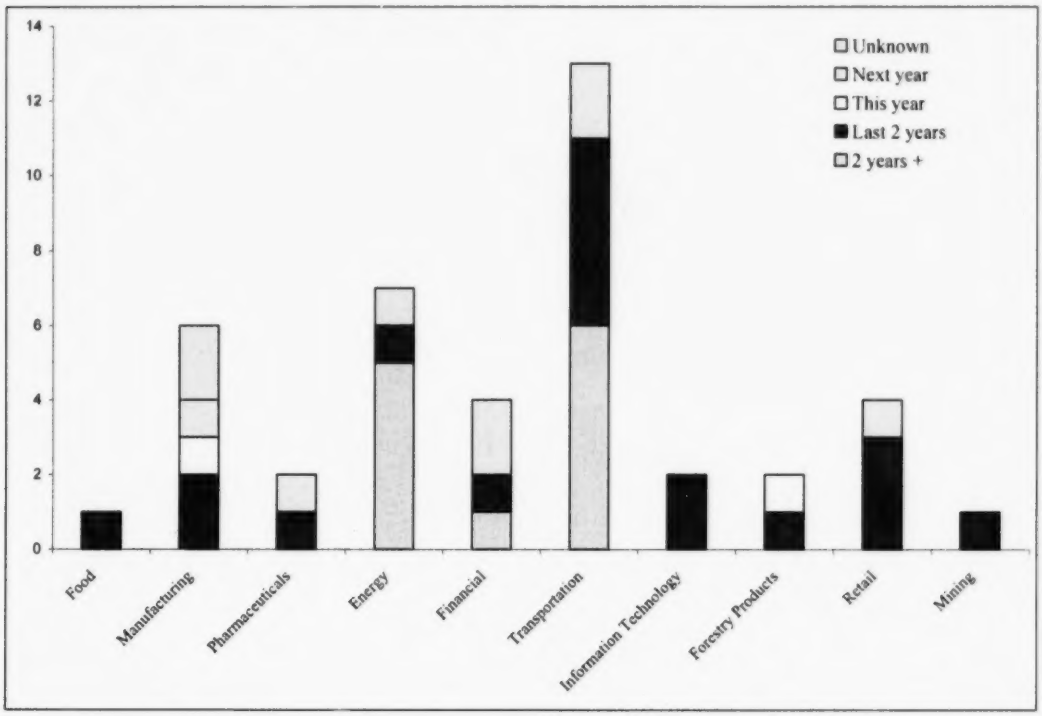


Figure 3-14 illustrates the amount of time devoted to emergency management functions by the respondents. Interestingly, 66% (26 of 39 responses) responded that they devote 100% of their time to emergency management; they are full-time emergency managers. The 26 responses were spread across eight sectors. Transportation has the largest number of emergency managers with nine of the 39 responses.

Figure 3-14 Time Devoted to Emergency Management (n=39)

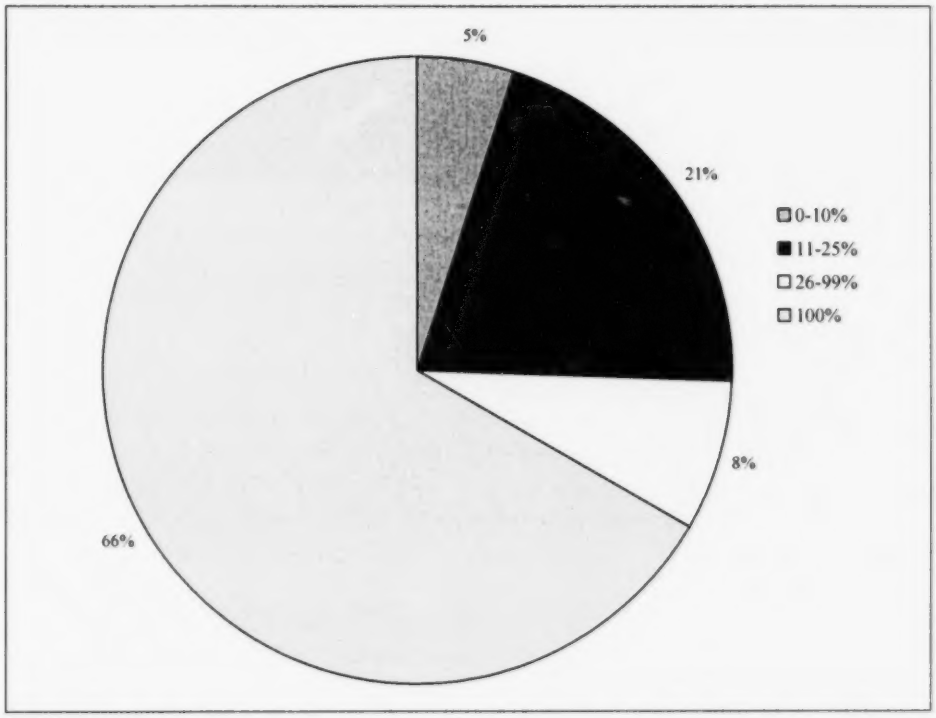


Figure 3-15 illustrates the emergency management requirement by the business/industry sector. Of note, in the transportation sector the "education not required" responses were dominated by the airport authorities. This response is considered indicative of typical first responder culture where training dominates professional development.

Figure 3-15 Emergency Management Education Requirement by Business/Industry Sector (n=42)

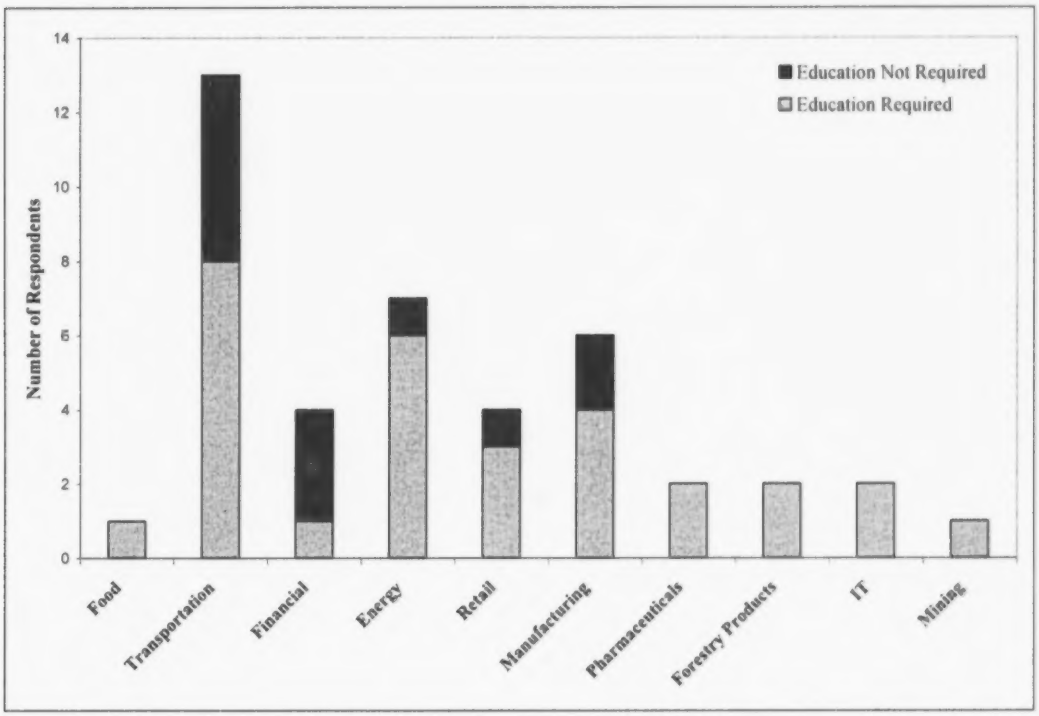
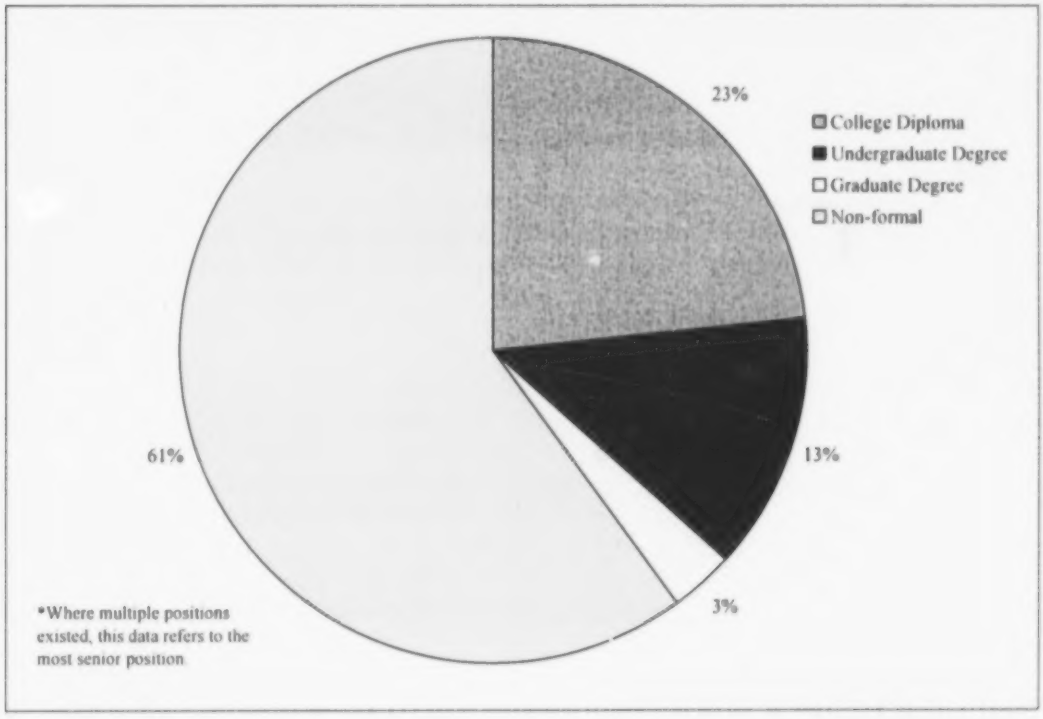


Figure 3-16 illustrates the type of formal emergency management education required. Respondents were asked to indicate if they believed formal emergency management education was required. Thirty of 42 respondents answered yes. However, when asked what level of emergency management education was required, 18 provided apparently contradictory responses by indicating "non-formal" as the level required. Based on supplementary information provided by nine of the 18, "non-formal" represented training.

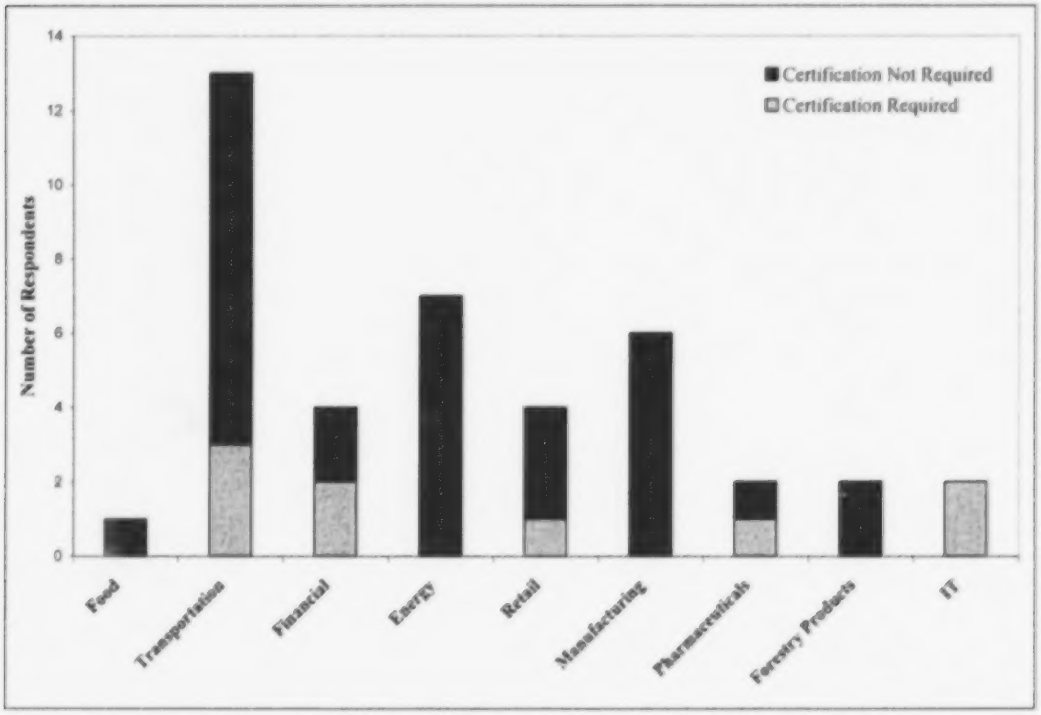
Figure 3-16 Type of Formal Emergency Management Education Required (n=30)



Of 42 responses, 33 indicated professional certification was not required. Ten of the 33 respondents represent the transportation sector and seven the energy sector. The research team believes that the high negative response may be indicative of the existing situation where most people performing emergency management functions have come into it as a second career and without a degree. Typically, certification programs require a degree as a prerequisite.

Figure 3-17 illustrates the requirement for emergency management professional certification by business/industry sector.

Figure 3-17 Requirement for Emergency Management Professional Certification by Business/Industry Sector (n=42)



3.3.2 Business/Industry Requirements

In Canada there are approximately two million businesses and industries of all types.[10] Of that number, 31,081 have between 50 and 99 employees, and 23,616 have more than 100 employees. Emergency management positions are typically non-revenue generating positions; in other words the costs associated with the position must be borne by overhead. Smaller companies (less than 50 employees) may not be able to support such a position as they generally try to have as few non-revenue generating positions as possible. Therefore, if emergency management positions are established in business and industry they are more likely to be found in larger companies.

Considering the number of companies with 50 or more employees, one might assume there may be a significant demand for emergency management professionals based on the following:

- the requirement for environmental emergency plans;
- the emphasis on business continuity and business resumption planning;
- increasing due diligence demands; and
- the number of Canadian businesses with 50 or more employees that may be able to support a non-revenue generating position.

The results of the questionnaire indicate that approximately 40% of businesses have or plan to have emergency managers. It is recognized that some of the responding business are in high-risk industries (e.g., energy, chemical manufacture), which could skew the survey results. However, based on the survey it can be conservatively estimated that 10 percent of Canadian business with 50 or more employees have or will have emergency managers within the next year.[11] Based on the numbers above the total private sector requirement for emergency managers may be conservatively estimated at 5,500.

3.3.3 Public Sector Requirements

There are approximately 4,200 municipalities in Canada according to the Federation of Canadian Municipalities (1,019 are registered members of the Federation).[12] Municipality size varies greatly. Because of the cost, the smaller municipalities are unlikely to have an emergency management professional. A conservative estimate would be that half of the municipalities employ an emergency management professional. A review of the provincial websites suggests the number of departments in each province/territory can be conservatively averaged at 15. Each province and territory has an Emergency Measures (or Management) Organization with an average complement of approximately 10 people per province. Therefore, based on the numbers above, the total requirement at the municipal and provincial/territorial level for emergency management professionals may be conservatively estimated at 2,425.

The federal Emergency Preparedness Act (1988) requires all federal cabinet ministers to develop plans to meet all types of emergencies within their particular areas of responsibility, as well as to provide support to other ministers and other orders of government facing an emergency. It is not unreasonable to expect that the individuals responsible for department emergency plans should be emergency management professionals. At this time there are 23 federal departments, most with regional responsibilities.[13] In addition, some departments operate emergency operations centres (e.g. Transport Canada) where one would also expect a proportion of operations centre

staff to be emergency management professionals. Although the precise number of emergency management professionals within these departments is unknown, for the purposes of this report, it is estimated that a conservative requirement is 15 per department.[14] This estimate is considered conservative because Public Safety and Emergency Preparedness Canada likely requires more than 10, and other departments are in the process of establishing new emergency management positions. For example, Health Canada is in the process of hiring emergency managers for each of their regions. Based on the numbers above the federal requirement for emergency managers can be conservatively estimated at 345.

Currently, there is an initiative to introduce the international "Chief Fire Officer" designation in Canada. At this time, a degree is not mandatory. However, a degree will automatically give an applicant 500 of the 2,000 points required for the "Chief Fire Officer" designation. The intent is to move the fire services across the country to an officer corps with undergraduate and graduate degrees. Both the President of the Fire Chiefs' Association of Canada and the Canadian Representative on the International Association of Fire Chiefs, believe that Fire Chiefs should have an advanced degree in administration and/or business with a concentration in emergency management.[15]

The Ontario Fire Service is phasing in a requirement for their officers to have a degree. All staffing competitions for Fire Service Officer positions now require an undergraduate degree (in any discipline) and/or an equivalent of training and experience. The intent is to move towards mandatory degrees for officer positions and post-graduate degrees for fire chiefs. The Ontario Fire Service is only accepting the training and experience options because of the lack of firefighters with degrees, and applicants with degrees have a distinct advantage over other applicants. There are approximately 600 fire departments in Ontario, each with an average of four officers, including the chief. They expect 75–80% of the current officers to retire in the next three to four years.[16] Based on this estimate, in Ontario alone there is a possible requirement for up to 2,400 people with a degree. One can assume that if emergency management education programs are available a proportion of these people would choose such programs. The other provinces and territories could not provide an estimate of the number of fire officers, fire departments or whether they were volunteer or professional within their jurisdictions. Therefore, to establish a rough estimate of the number of fire officers nationally, population data was used. Ontario, with approximately 40% of the population, has 2,400 officers. Using this ratio it is estimated that there may be as many as 3,600 fire officers in the rest of Canada. However, based on a higher ratio of volunteer fire departments in less populated areas, and to be conservative, it is assumed that there are at least 1,800 officers outside of Ontario. This gives an estimate of 4,200 fire officers nationally.[17]

In sum, the data suggests the public sector requirement for emergency management professionals is approximately 7,000. In assessing both the public and business sectors, there appears to be a significant demand for emergency management professionals. The conservative estimate is 12,500 people for positions that may require either broad or specific knowledge of emergency management principles and practices. However, there is a difference of opinion between the public and private sectors on the requirement for formal education, with the public sector recognizing the need and the private sector disavowing it (according to the survey).

The researchers believe this dichotomy may be explained by business/industry desiring the individual to have a firm understanding of the particular industry and the current situation of the people occupying emergency management positions not having formal emergency management education. The attitude of industry is not unreasonable. However, they need to be better informed on the benefits of hiring a person that not only understands the industry but also understands emergency management principles and practices as they relate to that industry. Influencing the current occupants of emergency management positions to accept the need for formal education is problematic because they see their job security as being jeopardized.

3.4 International Trends

The American experience suggests that public funding and leadership are essential for the development of undergraduate and graduate degree programs. Although there are now well established and self-sustaining university programs in the U.S., the initial programs were financed by the U.S. federal government. For example, the Natural Hazards Research and Applications Information Center at the University of Colorado, which was started with pre-Federal Emergency Management Agency (FEMA) money (out of the U.S. Department of Defense where many FEMA-type activities were focused prior to 1976) and has been in continuous operation for more than 25 years with support in large part from the National Science Foundation and a half dozen other federal agencies.[18] The Disaster Research Center was originally started at Ohio State University with federal funding and moved about 10 years ago to the University of Delaware.[19] The Disaster Management Center at the University of Wisconsin-Madison created a training and research program about 15 years ago that was funded largely by the U.S. Office of Foreign Disaster Assistance (in the Agency for International Development).[20]

In Australia, various emergency management agencies and universities identified in the mid to late 1980s a requirement for an increased level of education. This was a recognition that emergency management practitioners were being required to take on additional responsibilities without any formal emergency management education or qualifications. A collaborative training arrangement between Emergency Management Australia (EMA) and the Tasmanian State Institute of Technology (now part of the University of Tasmania) in 1988 evolved into an associate diploma program funded by EMA. Evolution continued with the program being adapted to a distance education format in 1996 with funding provided by a government grant. In 1995 the Tasmanian Associate Diploma program was transferred to Charles Sturt University (CSU) where it was developed into an undergraduate degree program. In 1998, CSU commenced development of a Master's degree program in emergency management with delivery via distance education initially offered in 1999. Other Australian higher education institutions also offer diploma and degrees in various fields (i.e. policing, ambulance services, pre-hospital care, etc.) that include an emergency management component. Additionally, some courses offered by the Australian Emergency Management Institute (the training and education arm of EMA) are being recognized for credit in undergraduate emergency management programs.[21]

4.0 Discussion

The review of current Canadian university and college programs and courses and the participant comments during the strategic planning session confirmed that, in a Canadian context, formal emergency management education is, with a few notable exceptions, very limited. This stands in stark contrast to Australia, the U.K., and the U.S., where programs are well established.

4.1 Emergency Management as a Discipline

The strategic planning session participants very clearly stated that emergency management is not yet a discipline. This assertion is supported by the review of university and college programs in Canada. College-level courses focus on providing the necessary skills for first responder occupations (i.e. Emergency Medical Technician). While such courses are important for their purpose, they are too narrowly focused to support emergency management as a discipline.

At the university undergraduate level, the Brandon University and Lakeland College programs offer different approaches to meeting the variety of potential student needs. By offering both an Arts and a Science degree, Brandon University recognizes the interdisciplinary aspects of emergency management. The Brandon program also acknowledges the need for practical experience. At Lakeland College the focus is narrower, specifically for emergency services administration. The University College of Cape Breton approach is different again as it is intended for those already possessing an undergraduate degree but desiring additional education in emergency management. None of the approaches can be labelled right or wrong, better or worse. They are only different ways of meeting the diverse needs of students. It is this very diversity that may make it difficult to recognize emergency management as a discipline.

At the undergraduate level, emergency management does not fit neatly into one area of study. It crosses established academic boundaries since it mirrors the practical world of the emergency management professional. As a potentially new discipline, emergency management is still evolving. There is as yet no consensus as to what subjects constitute the core body of knowledge or if defining a core body of knowledge is possible at this stage.

4.2 The Emergency Management Continuum – Education and Practical Experience

Professor John R. Harrald, Director, Institute for Crisis, Disaster, and Risk Management (ICDRM)[22] at George Washington University, views emergency management as "…a relationship between two streams, domain expertise and the application of theory."[23] Competency with theory is best obtained in the classroom; domain expertise in the field. The discipline demands a commitment to lifelong blended learning that links theory and practice. "EM (emergency management) is very much an applied field, not unlike medicine, law, or social work".[24]

Without a reasonable expectation for employment in emergency management, it is unlikely that the undergraduate student population would select emergency management as a career field. The corollary to this is that without a critical mass of students there is no requirement for universities to develop courses and conduct research. But is it necessary or even desirable to enter the emergency management education continuum only at the undergraduate level and to proceed

from there to graduate and post-graduate studies? The strategic planning session participants clearly did not accept this premise. The continuum can be entered at any point depending on individual needs and expectations. There already exists an emergency management community that requires research across the entire spectrum of potential emergency scenarios and consequences.

It would be too easy to suggest that the solution to this conundrum is for government (federal and provincial) to legislate the requirement for emergency management professionals within the public sector and within specific high-risk industries (i.e. petrochemical), although indirectly they are already doing this. Examples include The Canadian Environmental Protection Act and provincial emergency measures (management) acts.[25] The Canadian Environmental Protection Act requires government agencies and private companies with the potential to pollute to maintain environmental emergency plans. This, at least, suggests that someone knowledgeable in emergency management principles and practices should be developing, maintaining and implementing these plans. Legislation regarding emergencies in all but four provinces and territories makes it mandatory for provincial and territorial departments to have the capability to respond to emergencies and for municipalities to have an emergency measures coordinator.[26] Strategic planning session participants were wary about using legislation and regulation for the purpose of creating a career field for emergency management professionals. They suggested the development and sustainability of a pool of Canadian professional emergency management practitioners and researchers requires the cooperation of business, academia and government.

Business, academia and government must first recognize the need for emergency management professionals. Although not explicitly stated, based on existing legislation it appears that government at the federal and provincial level has recognized the need. One of the expectations of most Canadian citizens is the opportunity to live, work, and relax in a relatively safe and secure environment. That safety and security is often provided by the government in the form of emergency services (e.g. fire, police, and ambulance), and in legislation and regulation that dictates norms of behaviour for individuals, groups and companies.

The results of the survey questionnaire indicate that business and industry are moving in the right direction. The survey indicated that many sectors have recently established emergency management positions. This may be in reaction to legislation such as CEPA or to events such as 9/11 or in response to due diligence expected by shareholders. It is an investment for business/industry to establish emergency management positions, so it should have a positive effect on the bottom line. One way of ensuring the quality of emergency management education and research is to become directly involved. Business/industry involvement can take many forms, including funding research, providing work experience for students (i.e. co-op positions) and providing experienced practitioners to support educational programs.

If the enthusiasm of the strategic planning session academic participants is an indication, then academia should be eager to accept the challenge of educating emergency management professionals and providing the research to improve practices. Unfortunately, individual enthusiasm may be insufficient to produce the needed university programs. There are innumerable obstacles to establishing a university program, not the least of which is internal university politics. Because emergency management is seen as an interdisciplinary program,

proponents must establish a broad base of support within the university hierarchy. And even with required support, establishing the program may take years, typically three to five but sometimes up to 10. Given the timeline, a lot could happen that may derail the process.

Another problem facing academia is the lack of qualified Canadian educators. We are a nation of many languages, influenced by the numerous and diverse cultures that have contributed to the "Canadian" identity. In our daily lives the influence of the U.S. is never far away. Notwithstanding that, Canadians usually establish our own way of doing things. This is true of emergency management. Therefore, educators must recognize the Canadian methodology and be able to provide Canadian context to their lessons. At present, Brandon University must rely on international educators to deliver its emergency management program. This is not to suggest international educators are less capable or their credentials are somehow lacking, it only recognizes the unfortunate fact that there are few qualified Canadian educators.

One of the essential points brought out in the discussions during the strategic planning session was the need for a forum for practitioners and academics to discuss the needs of the emergency management community. Such a forum would help focus course development and research.

The strategic planning session participants supported the idea of certification for emergency managers. Typically one of the first requirements of a certification program is a degree. And therein lays the problem given that the majority of people currently employed as emergency managers do not have a degree. A Canadian professional certification requirement, similar to the IAEM Certified Emergency Manager (CEM) designation, has been discussed. This effort was being spearheaded by the Canadian Emergency Preparedness Association (CEPA). Unfortunately, it encountered a number of roadblocks that have derailed the effort. Also typical of the requirement for certification is that it becomes the driving force behind the creation of education programs.

4.3 Emergency Management Research – Developing a Solid Foundation

An integral part of emergency management education is applied research, that is, research conducted in the field by applying theory to practical situations to identify emerging trends and develop best practices.

In 1998, the University of South Australia co-sponsored a seminar series on Emergency Services Research Development.[27] Participants, including first responders and emergency managers, identified three key areas where their research skills needed to be developed to a more professional level:

- A more in-depth understanding of the applied research process from proposal writing through planning, fieldwork, and report writing, would allow participants to engage in and endorse research conducted by accredited third parties.
- An understanding of evidence-based practice, which "aims to bring research and practice together through the acquisition of the best available evidence to inform best practice"[28] (and has been successfully used in the field of medicine for a number of years) has far-ranging applications for the field of emergency management. Instruction in "...searching,

appraisal, and incorporation of the best available evidence"[29] can increase the judicious use of "...technologies and techniques (that) are well founded."[30]

- A greater understanding of the role research plays in identifying emerging trends and best practices can help professionals better manage specific threats such as mass casualty events and pandemics.

The strategic planning session underscored the need for quality research, and discussions generally supported the research direction suggested in the Australian seminar. In Canada, opportunities abound for ground-breaking applied research and development of longitudinal studies of complex emergency situations. Unfortunately, appropriately educated and trained researchers, particularly Canadians, are few and far between. There is general agreement, at least within the English-speaking countries researched, that development of emergency management education must include the development of the skills of practitioners in research areas that are not only focused on specific hazards (e.g. earthquakes), but include all aspects of mitigation, preparedness, response and recovery.

In Canada, one difficulty in establishing credible research programs is the disconnection between researchers and practitioners. Currently there is no forum for the sharing of information and the exchange of ideas between the two groups. For some the strategic planning session was the first Canadian opportunity to discuss areas of common interest. Suggestions for remedying this situation included establishing a national virtual private network (VPN) that connects university researchers across the country with practitioners in the public and private sectors. Another suggestion was for academic ex-officio representation on the Canadian Council of Emergency Management Organizations.

4.4 Creating the Infrastructure to Support Emergency Management Research and Expertise

The demands of the various degree programs, especially at the Master's and Doctorate levels, will be the main driver for research and will establish the Canadian body of knowledge in this field. Furthermore, university professors are required, as a condition of employment, to routinely conduct research and publish articles in professional journals and are encouraged to write books in the field.

There are existing Canadian models for establishing research programs that are well accepted. The strategic planning session mentioned three: NSERC, SSHRC and CIHR. Participants suggested that a council panel representing the three bodies could administer funding and set emergency management research goals.

Research indicates colleges and universities with emergency management programs should be linked in a virtual network to allow students and researchers to share data and collaborate on research projects across the country. This approach would maximize the benefits of the regionally delivered degree programs.

Directed research programs, such as the one sponsored by the Division of Research and Development (DRD) in Public Safety and Emergency Preparedness Canada should continue.

Such programs have the ability to focuses research to address emerging threats (e.g., climate change, sea rise, pandemic influenza, etc.).

Another possible approach for consideration is the creation of "research clusters" throughout the country based on the National Research Council (NRC) model. Clustering is a term that describes the growth of a significant concentration of innovative companies around a nucleus of research and development facilities, such as a university or a leading-edge government laboratory. Successful clusters are built upon teamwork, linkages and common purpose. An example of a successful cluster is the NRC promoted "Centre of Brain Repair" in the Halifax Regional Municipality. This centre is a partnership of local universities, hospitals and the private sector companies. Emergency/disaster mitigation research clusters could be created to address high risk threats in specific areas of Canada. For example, a centre for earthquake studies could be established in British Columbia and a centre for hurricane studies in Halifax.[31]

5.0 Conclusions

Canada lags far behind countries such as Australia and the U.S. in establishing emergency management education programs. What significance should be accorded to this situation? The obvious answer is Canada must immediately invest resources and considerable effort to narrow the gap. This may be the correct conclusion but for the wrong reason. Australia and the U.S. each have their own emergency management paradigms to meet their particular needs. While those needs may bear some resemblance to Canada's requirements, they are not completely congruent. Canada must establish a program that serves its paradigm regardless of what other countries may be doing. We should not ignore what is being done in other countries nor should we blindly copy another country's example.

A major factor in the Canadian situation is the need for leadership if emergency management is to be recognized as a profession and established as a viable career field of choice for high school students to consider. In the case of both Australia and the U.S., leadership was provided by the federal government with input from other levels of government. Unfortunately, in Canada, there is no single entity with the mandate to take on the leadership role. The current situation has individual provinces going their own way, which is their right by law. This typically has the unfortunate effect of reducing cooperation, coordination and interoperability. Until recently, it was believed that CEPA would provide the necessary leadership as the national body representing the emergency management community. That is no longer the case. The Government of Canada has a responsibility in this regard but so do other orders of government, academia, industry and non-government organizations (NGO). Within the federal and provincial governments, the departments to champion the emergency management cause already exist. The challenge is to co-opt academia, industry and the NGOs to the cause.

One way forward would be to have Public Safety and Emergency Preparedness Canada initiate a federal/provincial/territorial working group to investigate and address education requirements for Canadian emergency managers. Championing this with them should be the Canadian Council of Emergency Management Organizations (CCEMO). CCEMO was formed in 2002 with a membership consisting of the executive directors of Canada's provincial and territorial emergency management organizations. CCEMO's goals include:

- increased dialogue and cooperation between allied provincial and territorial agencies;
- the formation of a forum for the development of common and cooperative policies and programs; and
- the provision of a common point of contact in federal/provincial/territorial relations with the purpose of ensuring an inclusive relationship between government partners.

In Canada, emergency management education has not been identified as a requirement or priority. One result is a critical shortage of qualified Canadian educators to develop and deliver courses, to supervise post-graduate students and to conduct research. Even with the best of intentions and the application of significant resources, this predicament cannot be quickly overcome. It will take considerable time to produce sufficient qualified Canadian educators to reduce our current reliance on international educators.

Another result of the insufficient priority applied to emergency management education is the negligible amount of Canadian emergency management literature that could inform the body of knowledge. As in the shortage of Canadian emergency management educators, this state of affairs will not be easily or quickly resolved.

A Canadian forum does not currently exist for emergency management practitioners and academics to discuss and agree research priorities and for the sharing of information. Such a forum is critical for the development of courses and programs that recognizes the interdisciplinary approach and practical experience requirement for emergency management education that practitioners and academics deem necessary.

In Canada, the lack of recognition of emergency management as an emerging career field and the absence of qualified Canadian researchers has resulted in a dearth of Canadian emergency management research. There are existing Canadian models for research (i.e. NSERC, SSHRC, and CIHR) that may be examples for establishing a similar approach for emergency management.

Strategic planning session participants supported certification of emergency management professionals as they believed it would assist the establishment of educational programs. However, the results of the survey of industry did not support certification, possibly because the majority of current emergency management professionals do not have a degree (nor believe it necessary) and do not, therefore, meet one of the typical requirements of certification programs. Attempts by CEPA to establish a Canadian certification program were derailed by this issue.

6.0 Recommendations

Leadership is urgently needed if Canada is to have an emergency management education program that will develop and sustain a credible and viable body of emergency management professionals. The status quo is not acceptable. It would fail to create the synergy needed to produce a Canadian community of emergency management professionals uniquely suited to address the Canadian paradigm. The longer the current situation is allowed to persist, the more difficult establishing a national program becomes.

Ideally a national non-governmental body should lead this process, but no viable option currently exists. CEPA would have to re-invent itself to take the lead; a not impossible process but one that would take time and considerable energy, both of which could be better spent on program development. Therefore the next best option is to bring together the members of CCEMO (a national organization with standing and self-interest in a credible and viable emergency management community) with PSEPC to determine the way forward. Business and industry participation and opinion should also be solicited as part of this process.

Recommendation 1
• PSEPC should take the lead and initiate a federal/provincial/territorial working group with the goal of establishing national needs and educational guidelines for emergency managers.

This program could build on existing programs such as the Stuart Nesbitt White Fellowship and PhD programs at UBC and the University of Manitoba Natural Resources Institute. It should include a forum for the discussion of research priorities and for information sharing. The forum could be a virtual private network (VPN) that permits practitioners and academics to discuss, inform and debate emergency management issues.

Recommendation 2
• Through this working group, establish a program to support and educate the educators.

Through a council composed of representatives of NSERC, SSHRC and CIHP, a funding program targeted explicitly for Canadian research in risk, hazards and emergency management must be initiated. This would utilize a Canadian model for research funding that is well established and well accepted, and recognizes the interdisciplinary requirements of emergency management. The federal government could assume a leadership role in this initiative by providing funding for the creation of new research partnerships in EM, as was done for critical infrastructure protection in the NSERC-PSEPC Joint Infrastructure Interdependencies Research Program (www.nserc.ca/programs/jiirp_e.htm).

Recommendation 3
• Provide funding specifically for research related to emergency/disaster management priorities.

This program could build on existing programs such as the Stuart Nesbitt White Fellowship and PhD programs at UBC and the University of Manitoba Natural Resources Institute. It should include a forum for the discussion of research priorities and for information sharing. The forum could be a virtual private network (VPN) that permits practitioners and academics to discuss, inform and debate emergency management issues.

The federal government could promote research excellence and Canadian-based solutions by establishing a public and private sector partnership similar to that used for other fields in the National Research Council (NRC) model (www.NRC-CNRC.gc.ca). Such a partnership again utilizes a successful Canadian model that can be adapted to emergency management needs.

Recommendation 4
• Establish a public and private sector partnership to create research clusters for emergency/disaster management, based on the National Research Council model.

Although certification for emergency managers in Canada is desirable, the authors must conclude that the issue of nation-wide certification should be parked for now, while these fundamental educational programs and the foundation for emergency management as a profession in Canada are developed. The certification issue has been a contentious one in Canada, and has been seen to sap energy from the more important issues, creating an "us and them" frame of mind that benefits none. This will eventually resolve itself as new emergency management educated individuals enter the career field, and begin to leverage their knowledge and training to help build a forward-looking group of emergency management professionals in Canada.

Recommendation 5
• The issue of certification of emergency managers should be set aside for now, while fundamental educational programs and the foundation for emergency management as a profession in Canada are developed.

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Endnotes

[1] On 12 December 2003, the Office of Critical Infrastructure Protection and Emergency Preparedness was integrated into a new department, Public Safety and Emergency Preparedness Canada (PSEPC).

[2] Public Safety and Emergency Preparedness. www.ocipep.gc.ca/index.html (6 February 2004).

[3] Government of Canada. (December 2003). www.canlearn.ca

[4] The information collected during the review of college and university courses/programs was compiled in a MS Access database and provided to PSEPC as part of the project.

[5] Brandon University on-line calendar. www.brandonu.ca

[6] As Lakeland College is a degree granting institution, it is considered a university for this study.

[7] Lakeland College (February 2004). www.lakelandc.ab.ca

[8] Strategic planning session, Ottawa, 5 March 2004.

[9] "Lessons Learned" is a term that was not well received by some participants.

[10] Statistics Canada, Catalogue no. 61F0040XDB, 24 July 2001.

[11] To ascertain the exact number of emergency managers within industry would be a major undertaking and well beyond the scope of this project. However, the survey of industries is likely indicative of the numbers.

[12] Federation of Canadian Municipalities Membership list January 2004. www.fcm.ca

[13] Government of Canada website, January 2004.

[14] A closer estimate of the numbers will be ascertained and included in the final report.

[15] Fire Chief Mike Eddie, Canadian Representative on the International Association of Fire Chiefs committee on the "Chief Fire Officer Designation" programme, 29 January 2004.

[16] Fire Chief Rob Browning, President of the Fire Chiefs' Association of Canada, 28 January 2004.

[17] Neither Chief Eddie nor Chief Browning could provide an estimate of the number of fire officers or fire departments in Canada. Furthermore, the Presidents of Provincial Fire Chiefs were unable to provide this information.

[18] www.colorado.edu/hazards/, March 2004

[19] www.udel.edu/DRC/

[20] dmc.engr.wisc.edu/courses/response/BB08-apxF.html and epix.hazard.net/topics/research.html, March 2004.

[21] Dudley McArdle, the Director Strategic Education and Training for EMA, kindly provided insight into the Australian situation.

[22] The ICDRM website is located at www.gwu.edu/~icdrm/index.html.

[23] Hite, Monique C. (13 June 2003). The emergency manager of the future: Summary of a workshop (p. 10). Washington: National Research Council of the National Academies.

[24] Phillips, Brenda D. (22 October 2003). Disasters by discipline: Necessary dialogue for emergency management education (p. 21). Colorado: workshop presentation.

[25] The titles of the various provincial emergency measures acts differ. However, the intent and content of the acts are basically the same.

[26] The emergency measures acts of British Columbia, Ontario, Prince Edward Island and Newfoundland do not make it mandatory for municipalities to appoint Emergency Measures Coordinators.

[27] Arbon, P., & Smith, C. (Autumn 2000). Research development in the field of emergency management. Australian Journal of Emergency Management. Volume 15: Edition One, pp. 6–10.

[28] Ibid., p. 8.

[29] Sackett, D., Rosenberg, Wm., Gray, J.A., Haynes, R.B., & Richardson, W. (13 January 1996). Evidence-based medicine: what it is and what it isn't. British Medical Journal. Vol 312:71–72.

[30] Arbon, P., & Smith, C. (Autumn 2000). Research development in the field of emergency management. Australian Journal of Emergency Management. Volume 15: Edition One, p. 8.

[31] National Research Council of Canada website, February 2004.

Appendix A – Universities Polled to Identify Related Graduate Theses

Universities	Title	Name	E-mail
Alberta			
Calgary, University of	Dean of Graduate Studies	Dr. Robert Mansell	rmansell@ucalgary.ca
British Columbia			
Victoria, University of	Dean of Graduate Studies	Dr. Aaron Devor	graddean@uvic.ca
Manitoba			
Manitoba, University of	Vice-President Research	Dr. Joanne Keselman	joanne_keselman@umanitoba.ca
New Brunswick			
New Brunswick, University of	Dean of Graduate Studies	Dr. Gwen Davies	davies@unb.ca
Newfoundland and Labrador			
Memorial University	Vice-President Research	Dr. Christopher Loomis	vprsch@mun.ca
Nova Scotia			
Dalhousie University	Dean of Graduate Studies	Dr. Jan Kwak	jan.kwak@dal.ca
Ontario			
Carleton University	Vice President Research	Feridun Hamdullahpur	graduate_studies@carleton
Guelph, University of	Dean of Graduate Studies	Dr. Alastair Summerlee	gradden@exec.admin.uoguelph
Queens University	Dean of Graduate Studies	Dr. Ulrich Scheck	schecku@post.QueensU.CA
Toronto, University of	Dean of Graduate Studies	Dr. M. R. Marrus	graduate.information@utoronto.ca
Western Ontario, University of	Dean of Graduate Studies	Dr. Martin Kreiswirth	martyk@uwo.ca
Prince Edward Island			
Prince Edward Island, University of	Vice President Research	Dr. Katherine Schultz	ord@upei.ca
Saskatchewan			
Regina, University of	Dean of Graduate Studies	Dr. Rod Kelln	Rod.Kelln@uregina.ca
Saskatchewan, University of	Vice President Research	Dr. Steven Franklin	Steven.Franklin@usask.ca

Appendix B – List of Internet Search Words Used During this Study

1. Accident – Accident
2. Business continuity – Continuité des opérations
3. Catastrophe – Catastrophe
4. Crisis – Crise
5. Disaster – Désastre
6. Emergency – Urgence
7. Emergency management – Gestion des urgences
8. Emergency preparedness – Protection civile
9. Emergency response – Intervention en cas d'urgence
10. Fire – Incendie
11. Hazard – Danger
12. Health – Santé
13. Management – Gestion
14. Media management – Gestion des médias
15. Organizational behaviour – Comportement organisationnel
16. Psycho-social aspect of emergencies – Facteur psychosocial des urgences
17. Recovery – Recouvrement
18. Risk – Risque
19. Risk management – Gestion du risque
20. Safety – Sécurité
21. Security – Sécurité

Appendix C – Description of the Disaster and Emergency Studies Offered by Brandon University

The Applied Disaster and Emergency Studies (A-DES) program consists of 120 credit hours of instruction, leading either to a Bachelor of Science degree (B.Sc.) in Applied Disaster and Emergency Studies – Disaster Science Concentration, or a Bachelor of Arts degree (B.A.) in Applied Disaster and Emergency Studies – Planning and Management Concentration. The program is normally completed in four academic years. The acronym for the program, A-DES, is hyphenated to emphasize the 'applied' aspect of the program.

The Applied Disaster and Emergency Studies (A-DES) program at Brandon University adopts a Liberal Arts and Sciences approach to foster an appreciation for the interdisciplinary nature of this field. Students are introduced to the broad range of technological, cultural and environmental risks of disasters. There is no other comparable program available in Canada at the present time.

CORE CURRICULUM (both concentrations)

1. **Years One and Two:** After initial acceptance into the program, students will take a common core curriculum (51 credit hours) in their first two years that is designed to provide them with the necessary skills for subsequent studies. The core curriculum will foster an individual, team-oriented, cross-disciplinary approach to disaster prevention, mitigation and emergency assessment, planning, and management needs.

2. **Years Three and Four:** An additional 24 credit hours of core courses taken in the third and fourth years of the program, regardless of program stream, will provide students with an advanced appreciation for cross-disciplinary approaches to disaster and emergency studies. Instruction includes assessment procedures, operational decision-making, research and communication skills, and in-depth consideration of disaster and emergency issues from local and regional perspectives.

3. **Practicum:** A six credit hour practicum course is included in year four of the program and may be in conjunction with the Manitoba Emergency Services College, and other available options through municipal, provincial, and federal governments, industry, relief and voluntary organizations. The practicum course will include hands-on experience in disaster and emergency issues through research projects to be undertaken by:
    i. small groups of senior students drawn from the two program concentrations; **or** by
    ii. individual senior students addressing research needs of participating areas.

4. **Selecting a Concentration:** At the beginning of their second year, students will choose to follow one of the two concentrations (a minimum of 18 credit hours in either concentration) in which they will gain a deeper appreciation and knowledge of either the physical and biological aspects (Disaster Science Concentration) or the social, operational, planning and organizational aspects (Planning and Management Concentration) of all types of environmental disasters and emergencies. Within the planning and management concentration, there are distinctions made between preparedness and response planning as well as management and hazard mitigation planning and management. The distinction is

between the concepts of emergency/disaster management and hazards management. Both distinctions are presently accommodated within the planning and management concentration.

5. **Liberal Education Requirements:** the remaining 27 credit hours (to attain a total of 120 credit hours for a four-year degree) will allow students to take courses to meet Liberal Education Requirements, and to pursue their individual interests.

Course Code	Description
Year 1: Required Core Courses	
30:151	Written Expression: Structure, Substance, Style
38:170	Introduction to Physical Geography
38:190	Introduction to Weather and Climate
38:192	Environmental and Resource Issues
40:151	Foundations of Hazards and Disaster Studies
40:152	Conceptual and Applied Issues in Disaster Studies
42:162	Our Dynamic Earth
82:160	Introduction to Psychology
82:161	General Psychology
Year 2: Required Core Courses	
62:170	Introduction to Information Technology
38:376	Introduction to Geographical Information Systems
40:251	Natural Disasters: Causes and Physical Dynamics
40:252	Emergency Planning and Management
40:253	Hazards and Risk Assessment
90:155	Social Institutions and Processes
82:272	Organizational Psychology I
82:273	Organizational Psychology II
Year 3 and 4: Required Core Courses	
14:274	Environmental Health
38:391	Environmental Disasters: Appraisal and Responses
40:397	Emergency Preparedness and Response: Laws and Regulations
40:398	Organizational Response to Disasters and Emergencies
40/82:3YY	Conflict Resolution
40:497	Disasters and Development: Planning and Policy Issues
40:448	Environmental Disaster / Emergency Practicum

Appendix D – Strategic Planning Session Participants

Name	Organization	Phone #	E-mail
Michel Dore	Strategies Multi Risques	450-443-2500	michel.c.dore@multirisques.net
Emdad Haque	University of Manitoba, Director Natural Resources Institute	204-474-8375	haquece@ms.umanitoba.ca
Doug Harrison	Deputy Chief, Emergency Management Ontario	416-314-8622	doug.harrison@jus.gov.on.ca
Hal Jorch	University College of Cape Breton	1-888-959-9995 ext 1262	Hal_jorch@uccb.ca
Ernest MacGillivray	Director, New Brunswick Emergency Measures Organization	506-453-5507	ernest.macgillivray@gnb.ca
Fred May	Brandon University	204-571-8555	mayf@BrandonU.ca
Sarah Michaels	University of Waterloo	519-888-4567 ext 6863	michaels@fes.uwaterloo.ca
Laurie Pearce	BC Ministry of Children and Family Development	604-929-4560	laurie.pearce@gems5.gov.bc.ca
Robert Race	International Oceans Institute	902-209-1526	rrace@eastlink.ca
Rodney White	University of Toronto	416-978-6526	rodney.white@utoronto.ca
Lianne Bellisario	PSEPC	613-990-3305	Lianne.Bellisario@psepc-sppcc.gc.ca
David Hutton	Health Canada	613-941-6763	david_hutton@hc-sc.gc.ca
Christine Kowalyk	Emergency Management Ontario, Deputy Chief, Training and Education	416-212-3480	Christine.Kowalyk@jus.gov.on.ca
Andre Lamalice	PSEPC	613-990-2812	andre.lamalice@ocipep-bpiepc.gc.ca
Richard Paul	PSEPC	613-949-5018	richard.paul@ocipep-bpiepc.gc.ca
Ken Donovan	SAIC Canada, Program Manager	613-563-7242 ext 304	donovank@saiccanada.com
Monica Hornof	SAIC Canada, Junior Technical Specialist	613-563-7242 ext 340	hornofm@saiccanada.com
Bill Wong	SAIC Canada, Program Manager	613-991-1840	bill.wong@saiccanada.com

Appendix E – Strategic Planning Session Agenda

EMERGENCY MANAGEMENT EDUCATION

STRATEGIC PLANNING SESSION

Ottawa, Ontario, Canada
February 5, 2004

Time	Activity
8:00 – 8:30	Participant arrival, meet and greet
8:30 – 8:45	Introductions
8:45 – 9:00	Opening remarks
9:00 – 10:15	**Discussion #1** This discussion is intended to answer the question: "What is emergency management?" Questions that should be answered include: • What are the key elements that constitute emergency management? • Do these key elements vary between business/industry sectors, academia and/or government? • What should be considered outside of the scope of emergency management (i.e. occupational health and safety)?
10:15 – 10:30	Break
10:30 – 12:00	**Discussion #2** How could academic programs support the development of a core of graduates having a common body of emergency management knowledge? • What disciplines/programs might support the development of an EM program? • Who might the target students be? • How different are the requirements for undergraduate and graduate programs? • Is there currently a perceived demand?
12:00 – 13:00	Lunch

13:00 – 14:15 **Discussion #3**

How does academia acquire the expertise to developed and deliver college/university programs in emergency management?

- What expertise exists currently?
- What, if any, role might business/industry play?
- How long might it take to develop the expertise?

14:15 – 15:15 **Discussion #4**

How might current research in universities be leveraged to support/target work in the emergency management field?

- Is there research currently that is related to emergency management but is not identified as such?
- Is expertise currently available in universities to support emergency management research?

15:15 – 15:30 Break

15:30 – 16:30 **Discussion #5**

What role can/should colleges/universities play in promoting the development of emergency management as a profession?

- What partnerships currently exist that might be leveraged to support the development of an EM profession?
- What is the role of business and industry?
- What might the role of regulation be in promoting EM as a profession?
- What might the government role be?

16:30 – 17:00 **Wrap-up**

Appendix F – Business/Industry Questionnaire

Emergency Management Education Questionnaire

Introduction

To enable us to understand the current and potential requirement for formally educated emergency management professionals in business and industry, SAIC Canada developed this questionnaire for Public Safety and Emergency Preparedness Canada (PSEPC).

We recognize emergency management functions may be the responsibility of a variety of individuals. In some companies, it is the security professionals who are responsible; in others it may be a business continuity professional or perhaps the occupational health and safety professional. The attached questionnaire should be completed by the person in your company who is most familiar with your emergency management functions.

The questionnaire contains no questions that will identify the company. Your response is considered to be business proprietary information and as such there will be no attempt in the report to correlate individual responses to specific companies. The information gathered through this questionnaire will be used in graphs and charts to illustrate the potential requirement for emergency management professionals, and will be presented in a report assessing emergency management formal education in Canada.

Thank you for taking the time to complete and return the questionnaire. Please return the questionnaire by 20 February 2004 in the self-addressed and stamped envelope provided, or by fax at 613-563-3399.

Definitions

Formal education in this questionnaire refers to college diploma and/or university degree-granting programs.

Emergency management consists of four mutually supporting elements:

- Mitigation – actions to reduce or eliminate risks associated with all hazards;
- Preparedness – development of policies, plans and procedures for managing an emergency;
- Response – actions taken immediately before, during and/or directly after an emergency occurs; and
- Recovery – actions taken to repair or restore communities/infrastructure after an emergency.

The three general objectives of emergency management are to:

- Save lives, prevent injury and reduce suffering;
- Prevent or reduce property and other damages; and
- Prevent or reduce damage to the environment.

PART A – RESPONDENT IDENTIFICATION

1. What is your position title?

   _____

2. How many years have you been in your present position?

   a. Less than 1 ☐

   b. More than 1 but less than 2 ☐

   c. More than 2 but less than 4 ☐

   d. More than 4 but less than 6 ☐

   e. More than 6 but less than 8 ☐

   f. More than 8 ☐

3. What percentage of your workload is devoted to Emergency Management issues?

   a. None ☐

   b. Part time ☐ Estimate % _____

   c. Full time ☐

4. Indicate your level of formal emergency management education.

   a. None ☐

   b. College diploma ☐

   c. Undergraduate degree ☐

   d. Masters degree ☐

   e. PhD ☐

   f. Other _____

5. Indicate your responsibility for implementing emergency management functions.

   a. None ☐

   b. Corporate ☐

   c. Business unit ☐

   d. Other _____

PART B – CORPORATE EMERGENCY MANAGEMENT PROFILE

6. In which business/industry sector does your company perform (i.e. energy, telecommunications, etc.)?

   _____

7. In which province(s)/territory(ies) does your company operate? Check all that apply.

a. All provinces and territories	☐	i. New Brunswick	☐
b. All provinces	☐	j. Prince Edward Island	☐
c. British Columbia	☐	k. Nova Scotia	☐
d. Alberta	☐	l. Newfoundland and Labrador	☐
e. Saskatchewan	☐	m. Yukon	☐
f. Manitoba	☐	n. Northwest Territories	☐
g. Ontario	☐	o. Nunavut	☐
h. Quebec	☐		

8. How many employees does your company have?

a. 1 – 25 ☐

b. 26 – 50 ☐

c. 51 – 100 ☐

d. 101 – 500 ☐

e. 501 – 1000 ☐

f. more than 1000 ☐

9. What type of emergency plan does your company have?

a. Does not have an emergency plan ☐

b. I don't know ☐

c. All hazards ☐

d. Emergency specific ☐

If emergency specific, what types of emergencies does your plan address? Check all that apply.

i. Fire ☐

ii. Medical emergency (e.g. heart attack) ☐

iii. Chemical spill ☐

iv. Loss of power ☐

v. Radiological ☐

vi. Other _____

10. Has your company established a position for an Emergency Manager or someone who requires formal education in emergency management principles?

a. Yes ☐ Proceed to question 11.

b. Planning to establish ☐ Proceed to question 11.

c. No ☐

d. I don't know ☐

If your answer to question 10 was **No** or **Do not know**, this is as far as you need to go. Thank you for participating in the survey.

11. If your answer to 10 was **Yes** or **Planning to establish**, when was/will the position be established?

a. Last 2 years ☐

b. This year ☐

c. Next year ☐

d. Unknown ☐

12. How many positions were/will be established?

a. One ☐

b. Two ☐

c. Three ☐

d. Four ☐

e. Five ☐

f. Other ___

13. Where in the organization is the position located? Indicate the most senior position if more than one exists/will exist.

    a. Administration ☐

    b. Finance ☐

    c. Operations ☐

    d. Other _____

14. At what level in the organization is the most senior position established?

    a. Executive ☐

    b. Senior management ☐

    c. Middle management ☐

15. Describe the most senior position. Is it

    a. Full time ☐

    b. Part time ☐ Indicate % _____

    c. Filled ☐

    d. Vacant ☐

16. Does the position require the incumbent to have some formal emergency management education?

    a. Yes ☐ Proceed to question 17.

    b. No ☐ Proceed to question 18.

17. If your answer to 16 was **Yes**, indicate how many positions require a given level of formal emergency management education.

    a. College diploma _____

    b. Undergraduate degree _____

    c. Graduate degree _____

    d. Non-formal (e.g. training) _____

18. If your answer to 16 was **No**, what are the education requirements for the positions? Indicate the number of positions for each indicated level of education.

    a. College diploma related to your company's business/industry sector _____

    b. Undergraduate degree related to your company's business/industry sector _____

    c. Graduate degree related to your company's business/industry sector _____

    d. Other _____ _____

19. Do the positions require the incumbents to be certified by a professional association [e.g. Certified Emergency Manager (CEM), professional engineer, etc.]?

    a. Yes ☐

        i. How many _____

        ii. Which professional associations _____

    b. No ☐

You have completed the questionnaire. Thank you for participating in the survey.

Appendix G – Statistically Significant Sampling

Power Law Statistics

Designing an experiment that tests whether the sample represents the population can be tricky, depending upon what parameters are being investigated. The selection of questions and scoring criteria can effect how you analyze a sample survey. The selection of confidence intervals (discussed below) assumes a random sample of the population.

That being said, for our example we would like to know how many samples we require for this study. A Power Law statistical analysis is used for determining the sample size.

The sample size is determined using the following power law equation:

$$S = \frac{P_p\left(1 - P_p\right)P_s}{P_p\left(1 - P_p\right) + \left(\frac{\varepsilon}{z}\right)^2 \left(P_s - 1\right)}$$

where: P_p the population percentage
P_s is the population size
S is the sample size
z is the "z" score (1.96 for a Gaussian confidence level of 95%)
ε is the margin of error (or, the confidence interval)

The margin of error (confidence interval) is the (±) value reported in polling results. For example, using a confidence interval of 5%, and 50% of the sample picks an answer "A", it may be said that 45–55% (50±5%) of the population would have answered "A". The confidence level represents how often the true percentage of the population who would pick an answer lies within the confidence interval. The 95% confidence level suggests that one can be 95% certain of the results. For the above example, one can report 95% confidence that the true percentage of the population is between 45% and 55% of answer "A". It should be noted that the confidence level only applies to the confidence interval (i.e. if data is desired for the interval from 49% to 51%, a new evaluation must be made).

The population percentage (P_p) determines the accuracy of an experiment, and depends on the percentage of the sample that selects a particular answer. For example, if 99% of the sample selects "A" and 1% selects "B" the error is likely remote, regardless of sample size. However, if the percentages tend towards 51% and 49% there is a higher likelihood of error in the results. The most conservative approach when determining the sample size required for a given level of accuracy is to use the worst case percentage (P_p = 50%).

It is worthy to note that as the population size gets very large (> 20,000), the sample size tends towards:

$$S = \left(\frac{z}{\varepsilon}\right)^2 P_p\left(1 - P_p\right)$$

which is an interesting result, since as the population size gets large, the population size no longer matters to the sample size selected. The mathematics of probability proves the size of the population is irrelevant, unless the size of the sample exceeds a few percent of the total population you are examining. Population size is only a factor when using a small population, where Student-t distributions would dominate.

Population Size

According to Statistics Canada, there are approximately 400,000 businesses in Canada[1]. This number compares reasonably well to the 977,000 businesses with paid employees, as quoted by the Canadian Federation of Independent Business[2].

Using the CFIB statistics, approximately 2.6% of the total number of Canadian businesses employ 50 or more employees (approximately 23,500), whereas only 0.2% employ over 500 employees (approximately 2,000).

The target population for this study is organizations which might employ an emergency manager. Since it is highly unlikely that businesses with fewer than 50–500 employees will employ such a person, the target population consists of approximately 2,000 to 23,500 businesses.

Required Number of Responses

Case 1: Target Population of 23,500 Businesses
Assuming a 95% confidence, a population probability of 50% and a margin of error of 10%, you need 96 responses (samples). Assuming a 20% response rate, you require 480 polls out to get a sample of 96.

Case 2: Target Population of 2,000 Businesses
Assuming a 95% confidence, a population probability of 50%, and a margin of error of 10%, 92 responses (samples) are needed. Assuming a 20% response rate, 460 polls are required to achieve a sample of 92.

Conclusion: For the stated confidence levels, just under 100 responses are required. To achieve this level of response, approximately 500 polls must be taken.

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[1] Statistics Canada

[2] *Small Business – Big Picture*, Canadian Federation of Independent Business, www.cfib.ca, November 2003.